DOCUMENT RESUME

ED 189 385 CE 025 918

AUTHOR	Legacy, James
TITLE	Competency Based Curriculum in Two Agribusiness Types. Final Report.
INSTITUTION	Southern Illinois Univ., Carbondale. Board of Trustees.
SPONS AGENCY	Employment and Training Administration (DOL), Washington, D.C.
PUB DATE	Jun 80
NOTE	192p.
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	*Agribusiness; *Agricultural Education; Competency Based Education; *Curriculum Development; Grains (Food); Horticulture; Inservice Teacher Education; Meat Packing Industry; Minimum Competencies; Task Analysis; *Vocational Education
IDENTIFIERS	*Illinois

ABSTRACT

A project was conducted to (1) validate meat processing and grain elevator operation tasks for Illinois by relevant agricultural businesses, (2) conduct a national review of teaching materials in the target agribusiness areas, and (3) provide inservice training and develop a self-instruction, competency-based curriculum guide for Illinois horticulture teachers. Based on agribusiness validation interviews in counties with concentrations of each of the two target agribusiness areas, 144 tasks were identified for the Illinois meat processing industry and 127 tasks were identified for the grain elevator industry. Other project activities included five series of three-meeting workshops for horticulture teachers on competency-based education. As a result of these workshops, forty-two vocational horticulture teachers wrote locally directed competency-based teaching materials for their classes. (Appended material includes the list of meat processing tasks, the list of grain elevator tasks , a working copy of the Self-Instructional Guide for Developing Locally Directed Competency Based Curriculum, and a sample locally directed competency-based teaching unit.) (LRA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED189385

FINAL REPORT

COMPETENCY BASED CURRICULUM
IN
TWO AGRIBUSINESS TYPES

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C. Reisinger

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CE025918

Illinois State Board of Education
Donald F. Muirheid, Chairman

State Superintendent of Education
Joseph M. Cronin

TITLE: Competency Based Curriculum in Two Agribusiness Types

AGENCY: Illinois State Board of Education

DEPARTMENT: Department of Adult Vocational and Technical Education
Springfield, Illinois
June 1980

DISCLAIMER

The project titled Competency Based Curriculum in Two Agribusiness Types, DAVTE funding agreement number R33-30-X-0442-102, was developed pursuant to a funding agreement with the Illinois State Board of Education/Department of Adult, Vocational and Technical Education/Research and Development Section, 100 North First Street, Springfield, Illinois 62777. Opinions expressed in this final report do not reflect, nor should they be construed as, policy or opinion of the Illinois State Board of Education or its staff.

SUMMARY

The National Advisory Council on Vocational Education has encouraged the establishment of programs in new career areas specifically naming areas of agriculture as priorities.

In Illinois agriculture is a large and growing industry. Statewide, employment in agricultural businesses is increasing. Agricultural businesses are employing an increasing number of workers in an expanding variety of business area specializations and job titles. Vocational agribusiness education is in a formative stage. While several vocational agribusiness classes are operative, most Illinois schools offer these as supplementary to the traditional production agriculture program. This project is developing field centered, competency based teaching materials which are designed to support new and emerging vocational agribusiness programs. One part of this project inserviced 42 Illinois vocational horticulture teachers. These teachers used competency based procedures as the basis for determining local teaching activities. The teachers' experiences provided a test situation for use of a self-instruction guide for developing competency based curriculum. This guide is attached as Appendix E.

The second work area of the project was initiating competency based curriculum to prepare youth for meat processing and grain elevator occupations. The project staff developed lists of tasks for these occupations and validated them with 36 industry interviews. The validated list was used to prepare a bulletin titled "Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries."

With the research results of this project and the previous phase, vocational agriculture educators can with reason and rationale, move toward the development of competency based teaching materials with a proven process and in a proven style.

DISCLAIMER ii

SUMMARY ii

ABSTRACT vi

LIST OF CONSULTANTS vii

FINAL PRODUCT ABSTRACTS

Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries viii

RESOURCE LISTING - None

CHAPTER I - ACCOMPLISHMENTS 1

Completion of Meat Processing Task Analysis
Completion of Grain Elevator Task Analysis
Competency Based Inservice for Horticulture Teachers
National Search for Meat Processing and Grain Elevator Curriculum

CHAPTER II - MAJOR ACTIVITIES AND EVENTS 3

Introduction
Planning Using a Functional Schematic
Task Analysis Procedures and Results--Meat Processing
Statement of the Problem
Purpose of the Study
Research Questions
Significance of the Problem
Limitations
Definition of Terms
Review of Meat Processing Curriculum Materials and Studies
Pre-testing the Interview Form
Identification of Geographic Areas
Selection of Meat Processors to be Interviewed
Conducting the Interviews
Results of the Interviews
Organizing Task Data for Curriculum Development
Task Analysis Procedures and Results--Grain Elevator
Introduction
Statement of Problem
Research Questions
Significance of Problem

Limitations
Definition of Terms
Review of Grain Elevator Curriculum Materials
Developing the Task List and Interview Form
Pre-testing the Interview Form
Selection of Grain Elevators to be Interviewed
Conducting the Interviews
Summary of the Interviews
Organizing Task Data for Curriculum Development
Testing the Self-Instruction Guide
  Involving teachers
  Conducting classes
  Summary of teacher use of competency based guide

CHAPTER III - OTHER ACTIVITIES, RESULTS, AND RECOMMENDATIONS 64

Problems
Publicity and Dissemination Activities
Resource Persons
Summation of Evaluation Data Collected
Conclusions and Recommendations
  Horticulture inservice activity recommendations
  Task analysis or purposive study recommendations
Staff Employment and Utilization

APPENDICES . . . . . .

A. List of Meat Processing Tasks 67

B. List of Grain Elevator Tasks 80

C. Advisory Committee Materials 92

D. Publicity and Dissemination Materials 101

E. Working Copy of "Self-Instruction Guide for Developing Locally Directed Competency Based Curriculum" 105

F. Sample Locally Directed Competency Based Teaching Unit 159

G. List of Grain Elevators and Meat Processors Interviewed 176

FINAL REPORT

FOR

DAVTE Funding Agreement Number: R33-30-X-0442-102

Official Project Title:	Competency Based Curriculum in Two Agribusiness Types
Funded Agency:	Department of Vocational Education Studies and Department of Agricultural Education & Mechanization Southern Illinois University/Carbondale Carbondale, IL 62901
Time Period Covered:	July 1, 1979 - June 30, 1980

ABSTRACT FOR FUNDING AGREEMENT WITH
ADULT, VOCATIONAL AND TECHNICAL EDUCATION

TITLE: Competency Based Curriculum in Two Agribusiness Types

PRINCIPAL INVESTIGATOR: Dr. James Legacy
INSTITUTION: Board of Trustees of Southern Illinois University
LOCATION: Carbondale, IL 62901

OBJECTIVES OF PROJECT:

1. A validation of meat processing and grain elevator operation tasks for the state by relevant Illinois agricultural businesses

2. A national review of teaching materials in the target agribusiness areas

3. Inservice training and development of a self-instruction competency based curriculum guide for Illinois horticulture teachers

PROCEDURES OF IMPLEMENTATION:

- identify Illinois target agribusinesses
- select business sites for validation interviews in counties with concentrations of each of the two target agribusiness areas
- first advisory committee meeting
- conduct agribusiness validation interviews on site and mailed
- distribute draft outline of project curricula to teachers
- conduct national search for teaching materials already developed for the target areas

Self-instruction Competency Based Curriculum Guide in Horticulture
- print competency based model developed in Phase II
- select 15 horticulture teachers for inservice
- conduct inservice program development of competency statements for 7 areas of horticulture
- prepare self-instruction CBVE guide for horticulture
- test guide with 15 horticulture teachers
- write final report for AVTE

CONTRIBUTION TO VOCATIONAL AND TECHNICAL EDUCATION:

The uniqueness of this study is in the newness of these products to the curriculum development process in Illinois. Development of a self-instruction CBVE guide - this model will give examples and self-instruction directions which will assist vocational teachers in basing their instruction on valid industry competencies.

PRODUCTS TO BE DELIVERED:

1. Final report
2. List of validated tasks in meat processing and grain elevator operation for Illinois
3. List of curriculum development priorities in the target job clusters by task area
4. Self-instruction CBVE guide for horticulture

ADVISORY COMMITTEE AND CONSULTANTS

Allen Dietz
Sycamore High School
Sycamore, IL 60178

J. T. English
Personnel Division
DuQuoin Packing Company
Box 186
DuQuoin, IL 62832

Dalton Gray
Sauk Area Career Center
138th & Crawford
Robbins, IL 60427

Herb Hoeman
Grain and Feed Association of Illinois
2001-B West Monroe Street
Springfield, IL 62704

Larry Humble
Illinois Grain Corporation
Bloomington, IL 61701

LuAnn Luecking
Joe's Meat Market
R.R. #2
Mascoutah, IL 62258

David Manning
Wilco Area Vocational Center
R.R. #3 Box 214, Hopkins Road
Lockport, IL 60441

Jim Morrison
Collinsville Area Vocational Center
2201 W. Morrison
Collinsville, IL 62234

Norbert Pohlman
Quincy Vo-Tech School
Quincy, IL 62301

Steve Powell
Animal Industries
Southern Illinois University
Carbondale, IL 62901

Thomas B. Range
Cahokia High School
800 Range Lane
Cahokia, IL 62206

John Romans
Meat Extension Specialist
College of Agriculture
132 Davenport Hall
University of Illinois
Urbana, IL 61801

Alvin Schnitker
Irvington Elevator
Irvington, IL 62848

Mike Sheer
Addison Trail High School
213 N. Lombard Road
Addison, IL 60101

Herb Sutter
Randolph Service Co.
Sparta, IL 62286

Walter J. Wills
Agribusiness Economics
Southern Illinois University
Carbondale, IL 62901

Kathi Wright
1857 S. Washington #301
Naperville, IL 60540

CURRICULUM MATERIALS ABSTRACT

TITLE: Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries

Date Developed: June 1980

Date of the Abstract: June 1980

Name of Developers: James W. Legacy
Southern Illinois University at Carbondale
through contractual agreement with Illinois
State Board of Education, DAVTE
Springfield, Illinois

Type of Materials: Specialized Instructional Materials Paper Bound

Target Level of Student: Grades 9-12 and 13-14

For Professional Use: Classroom Teacher

Is Training Required for Use of These Materials: Yes

Are Consulting Services Available: Yes

If So, by Whom: Agricultural Consultant, Illinois State Board of Education, DAVTE

Copyright Restrictions: No.

Provisions for Acquiring Material: at cost through WIU Publications Clearing House

To Order Contact: Curriculum Publications Clearing House
47 Horrabin Hall
Western Illinois University
Macomb, IL 61455

Descriptor:

A description of beginning worker duties is detailed for meat processing and grain elevator businesses. Each business description is detailed with a list of specific work duties and a series of work site pictures. This publication is intended to introduce both teachers and students to the training requirements of beginning workers in meat processing and grain elevator occupations.

State Submitting Abstract: Illinois
East Central Curriculum Management Center
Illinois State Board of Education
Dept. of Adult, Vocational & Technical Education
100 N. First St. E426
Springfield, IL 62777
217-782-0758

CHAPTER I

ACCOMPLISHMENTS

In recent years vocational agriculture curriculum development has become more systematic. The use of task analysis as the basis for teaching materials has developed an emphasis on competency based vocational education (CBVE). In agriculture, McClay (1978) has produced national guidelines for CBVE. As the move to competency based education continues, it is important that the process used to determine which competency to teach provides valid information. Past studies by Legacy and Bennett (1978) and Legacy and McCarter (1980) determined that industry interviews provided valid task analysis information. The two agribusiness types selected for industry task analysis were meat processors and grain elevators. In addition to completing a task analysis interviews, the project provided inservice education to Illinois vocational horticulture teachers. The inservice education provided horticulture teachers with locally developed competency based teaching materials. Teachers interviewed industry and developed teaching materials based on beginning worker tasks.

Completion of Meat Processing Task Analysis

A list of 144 tasks was identified for the Illinois meat processing industry. The industry was categorized into two types--those that process and operate a kill floor and those which process without operating a kill floor. Meat processors were sampled by type from geographic regions and interviewed. The results of 20 interviews determined 54 tasks in eight major work categories were typically performed by the beginning worker.

Completion of Grain Elevator Task Analysis

A list of 127 tasks was identified for the grain elevator industry in Illinois. Illinois grain elevators were categorized into three types--by size--sampled by geographic regions and interviewed. The results of interviews determined 24 tasks in six major work categories were typically performed by beginning workers.

Competency Based Inservice for Horticulture Teachers

A list of 206 Illinois horticulture teachers was compiled. Teacher interest in a competency based workshop was greater than the project goal of 15 teachers. One hundred and two teachers indicated interest. After five series of three meeting workshops, 42 vocational horticulture teachers had written locally directed competency based teaching materials for their classes. Presently these materials are being prepared for testing by other teachers and dissemination in and beyond the State. A sample completed set of teacher developed material is attached as Appendix F. A brief description of each teacher developed unit is included and found on pages 59-60 of this report.

National Search for Meat Processing and Grain Elevator Curriculum

Requests to state education agencies, curriculum materials services both private and public resulted in a wide variety of educational materials on these topics. Although none of the materials were determined to be developed via the task analysis competency based process, several instructional packages are being purchased by employees and employers as training guides. The materials located should provide an excellent source of ideas for determining an appropriate strategy for introducing meat processing and grain elevator occupation material to Illinois students.

CHAPTER II

MAJOR ACTIVITIES AND EVENTS

Introduction

Completion of the 1978-1979 ag occupations project provided the basis for the activities of this project. The two agribusiness types studied were selected from the agricultural matrix of the previous project. The horticulture inservice activities were based upon successful procedures used in the retail florist curriculum development of the previous project. The purpose of this chapter is to document the procedures used in completing the task analysis of meat processing and grain elevator businesses and steps followed while conducting the horticulture inservice program.

Planning Using a Functional Schematic

A functional schematic was used to plot the necessary activities of the project. This technique was most helpful in anticipating project needs and in assigning responsibilities to individual staff members. The schematic used during the project is presented as Figure 1.

Task Analysis Procedures and Results--Meat Processing

The meat processing business in the United States is one of America's biggest dollar volume industries. In 1976 reported sales exceeded 38 billion dollars from an estimated production of 39 billion pounds of meat. On January 1, 1978 the cattle population for all breeds was placed at 116.2 million head (Levie, 1979).

Step 1 activities: 1- 6: July 1 - Sept. 30
Step 2 activities: 7- 9: Oct. 1 - Dec. 31
Step 3 activities: 10-14: Jan. 1 - March 31
Step 4 activities: 15-22: April 1- June 30

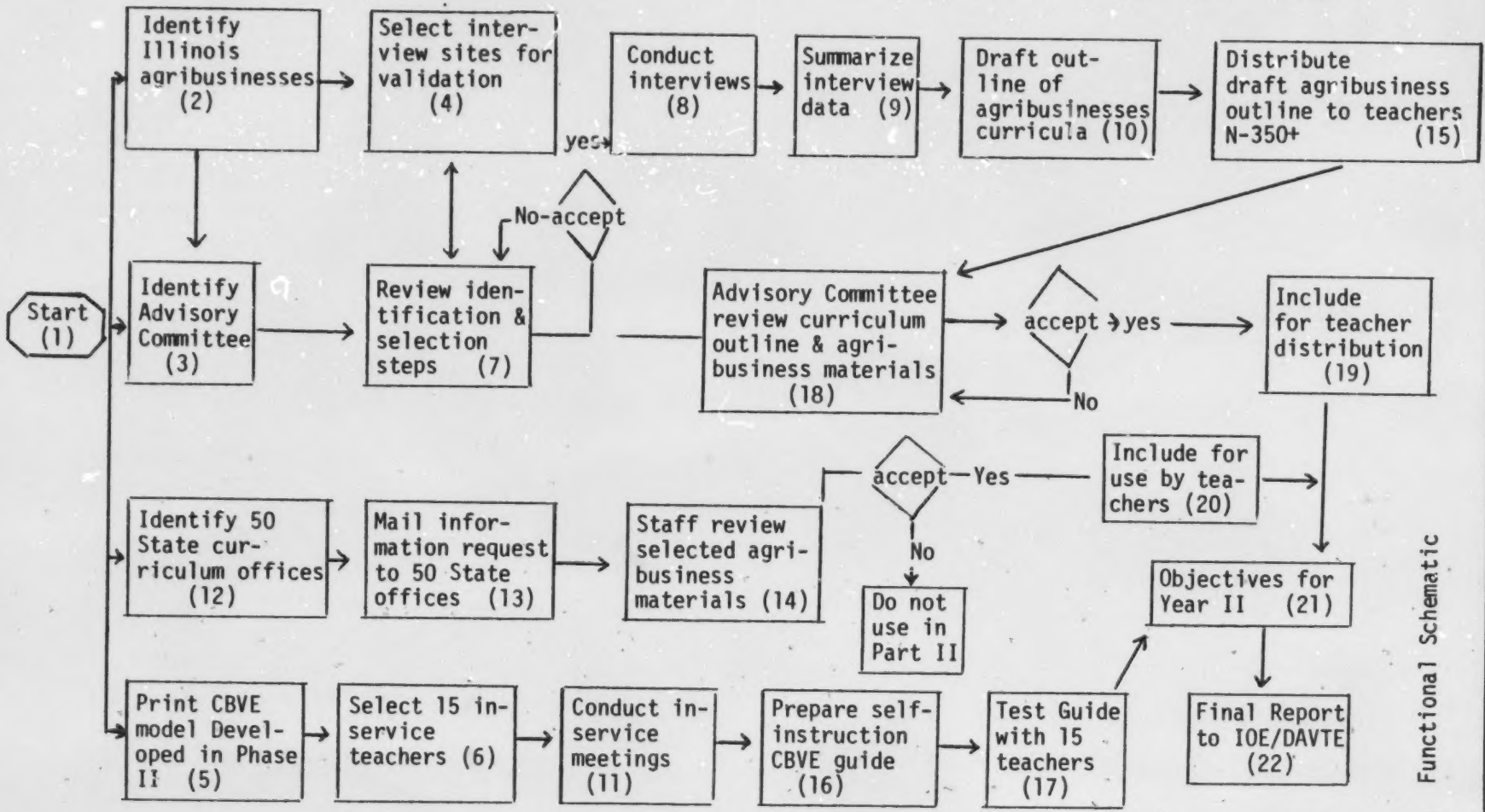

Start (1)
Identify Illinois agribusinesses (2)
Identify Advisory Committee (3)
Select interview sites for validation (4)
Review identification & selection steps (7)
No-accept
yes
Conduct interviews (8)
Summarize interview data (9)
Draft outline of agribusinesses curricula (10)
Distribute draft agribusiness outline to teachers N-350+ (15)
Advisory Committee review curriculum outline & agribusiness materials (18)
accept
yes
No
Include for teacher distribution (19)
Identify 50 State curriculum offices (12)
Mail information request to 50 State offices (13)
Staff review selected agribusiness materials (14)
accept
Yes
No
Include for use by teachers (20)
Do not use in Part II
Objectives for Year II (21)
Print CBVE model Developed in Phase II (5)
Select 15 in-service teachers (6)
Conduct in-service meetings (11)
Prepare self-instruction CBVE guide (16)
Test Guide with 15 teachers (17)
Final Report to IOE/DAVTE (22)

Figure 1. Functional Schematic

At one time, farmers did their own butchering, smoking and curing of the meat that would be consumed by the family. If time and labor permitted, the farm may have butchered more animals to be prepared and sold to the general store, where it was made available to the town people. Most sold meat was smoked and cured or dried for preservation purposes at this period.

As farm size increased and livestock producers began to specialize, slaughter houses in major towns began to flourish where vast numbers of meat animals were killed and packaged for sale.

When smaller towns began to form, small slaughter houses, called butcher shops, began to arise in an attempt to bring fresh meat closer to the customer. When they became established, many butchers branched out to include sausage, bacon and other processed meats in the business. Today there are several types of meat processing businesses. They can be loosely sorted into the following categories:

1. slaughter house
2. branch house
3. breaker
4. boner
5. processor
6. retail butcher
7. locker plant
8. hotel supply house

These eight categories make up the general distribution channels for the meat industry. A flow chart of the distribution channels is shown in Figure 2. An explanation of each category can be found in the definition section.

All eight of the categories of meat processing businesses require specialized workers skilled in the art of meat cutting and processing. Skilled workers are in short supply for the meat processing business at the present time.

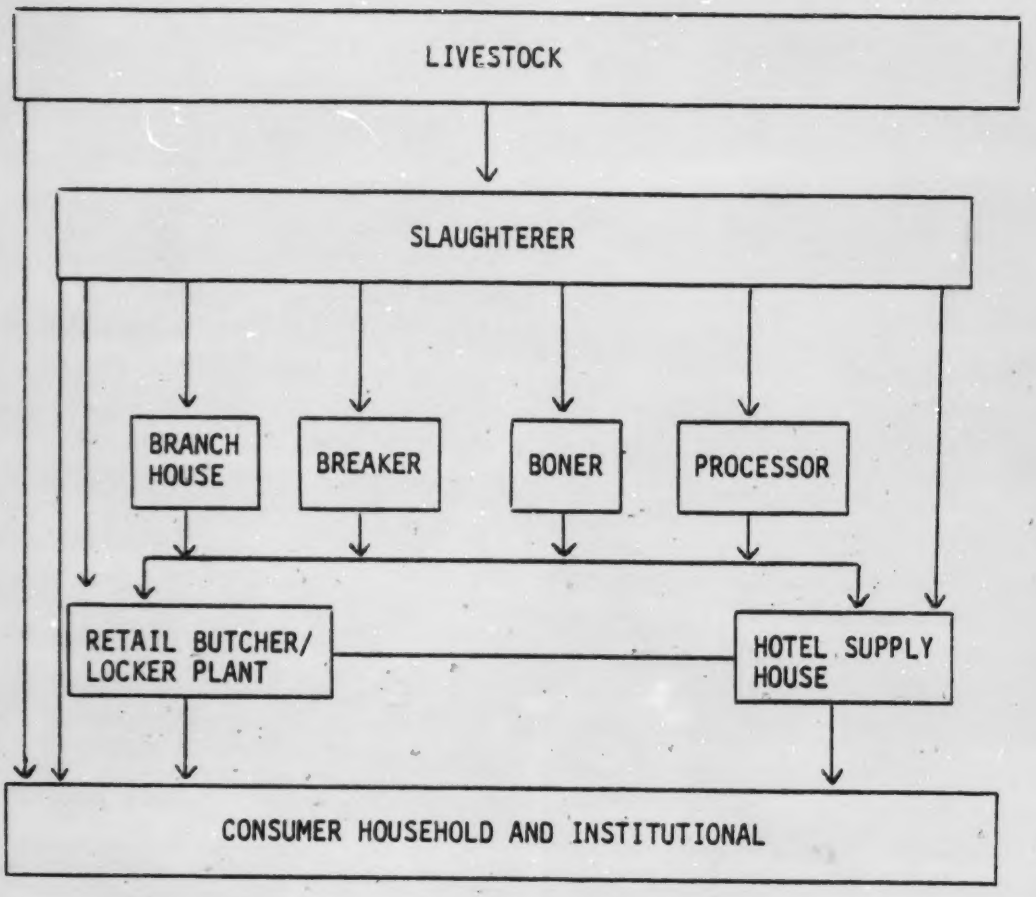


Figure 2. Meat Distribution Channels

Statement of the Problem

Many universities and colleges offer four-year programs in the scientific and practical phases of the meat production industry. In some states, but unfortunately not in Illinois, there are trade schools which offer short training programs in meat preparation. These are often costly and unavailable for many people.

In the meat processing industry in Illinois there are certain competencies required for beginning and advanced level employees. At present, these competencies are being taught in the industry on the job.

Purpose of the Study

The purpose of this project was to identify beginning and advanced meat processing competencies. Secondly, to determine the most appropriate educational setting for teaching meat processing competencies.

Research Questions

1. What agencies are involved in the meat processing business?
2. How many meat processors are there in the state of Illinois that are state inspected?
3. What tasks are performed in a meat business and how often are they done?
4. What do meat processors want beginning workers and advanced workers to know?

Significance of the Problem

With the large number of meat businesses in Illinois and the lack of available training prior to on-the-job experience, the meat industry suffers from a shortage of competent workers. It must be determined what should be taught to potential workers of this industry and in what setting this learning should take place. Once these factors have been identified and defined, secondary and post-secondary schools may utilize the competencies to establish technical, vocational or cooperative training programs. In this way meat processing businesses are offered a source of competent employees while students are educated and introduced into the job market through supervised occupational experience or cooperative education programs.

Limitations

The study was limited to 10 primary processors and 10 secondary processors that are inspected by state meat inspectors of Illinois. Two processors in each category were randomly chosen from each of the five geographic regions of Illinois. The counties in each of the regions are:

Region 1: Carroll, Jo Daviess, Stephenson, Winnebago, Boone, McHenry, Lake, Ogle, DeKalb, Kane, Cook, DuPage, Lee, Bureau, Putnam, LaSalle, Kendall, Grundy, and Will.

Region 2: Whiteside, Rock Island, Henry, Mercer, Henderson, Warren, Knox, Stark, Marshall, Peoria, Woodford, Tazewell, Fulton, McDonough, Adams, Hancock, and Schuyler.

Region 3: Kankakee, Livingston, Iroquois, Ford, McLean, Vermilion, Champaign, Piatt, DeWitt, Logan, Macon, Edgar, Douglas, Coles, Moultrie, Christian, Shelby, Clark, Cumberland, Effingham, Jasper, and Crawford.

Region 4: Mason, Cass, Menard, Sangamon, Morgan, Brown, Pike, Scott, Bond, Calhoun, Greene, Macoupin, Jersey, Madison, Fayette, and Montgomery.

Region 5: Monroe, St. Clair, Clinton, Marion, Clay, Richland, Lawrence, Wabash, Edwards, Wayne, Jefferson, Washington, Randolph, Perry, Franklin, Hamilton, White, Gallatin, Saline, Williamson, Jackson, Union, Johnson, Pope, Hardin, Massac, Pulaski, and Alexander.

The basic qualification for the list of meat processors developed by the advisory committee was that all meat processors who would be interviewed should be progressive operators. A progressive operator was defined as one who moves forward with new and innovative ideas, accepting or creating changes and promoting new ideas and products for the benefit of the industry.

Definition of Terms

Branch House: A packer operated sales organization remote from the slaughter house but close to the point of distribution. Usually a full line of products is offered.

Breaker: A non-slaughterer who buys beef carcasses and breaks them into primal cuts.

Boner: A non-slaughterer who buys beef, veal, or some pork cuts for boning and possible processing. Some boning is conducted at almost every level of distribution.

Processor: There is a wide variety of processors:

a. Canners
b. Curers
c. Smokers
d. Sausage makers
e. Prepared foods
f. Steak makers

A non-slaughterer who may specialize in one of the above areas or run a diversified operation encompassing more than one area.

Packing House: A complex business organization engaged in the slaughtering and marketing of meat, and the manufacture and distribution of multiple by-products.

Livestock: All farm-raised meat animals and poultry.

Slaughter House: A place where animals are butchered for food.

Wholesale Cuts: The seven basic cuts of meat generally indicating their location; chuck, sirloin, rib, round, plate, flank, short loin.

Retail Cuts: The cuts of meat that are available to the customer.

Sides: One half of a carcass consisting of one forequarter and one hindquarter.

Forequarter: All of the anterior portion of the side after the severence from the one-rib hindquarter.

Hindquarter: All of the posterior portion of the beef side remaining after severence from the 12-rib forequarter.

Meat Processing: All processes utilized in altering fresh meat including curing, smoking, canning, cooking, freezing, dehydration, production of intermediate-moisture products, the use of certain additives such as chemicals and enzymes and the cutting, grinding, and packaging of fresh meat.

Meat Processors: All those establishments that are involved in the processing of meats.

a. primary processor: Establishments that are involved in the processing of meat in many phases from slaughter to sales.

b. secondary processor: Meat departments in grocery stores and other places where only wholesale and retail cuts are handled for sale to the consumer.

Life Role: A group of like activities which are performed to satisfy an individual need or responsibility.

Task: The smallest unit of activity within a role.

Review of Meat Processing Curriculum Materials and Studies

A number of books have been written on meat production, meat science, livestock growth and the meat industry. The majority of these books are used in four-year institution meat programs or technical schools and are too technical to lend themselves useful to an introductory study of meat processing.

A list of meat industry tasks was developed by utilizing the combined resources of related literature, the advisory committee, progressive meat business representatives chosen for interview purposes to validate the task list, and the Educational Resources Information Center (ERIC). The National Ag Occupations Competency Study (1978) was a useful source of several identified and validated competencies in the meat processing business. Additional tasks were added from the suggestions of the committee or progressive meat processing business representatives of Illinois and the Illinois Meat Extension Specialist.

A committee composed of one faculty member from the Department of Animal Industries and one faculty member from the Department of Agricultural Education and Mechanization, both of the School of Agriculture, Southern Illinois University at Carbondale, four representatives of the meat processing business, and one Meat Extension Specialist from the University of Illinois, reviewed the original task list. Members currently involved in the meat processing business acted as outside information sources to fill

out the committee. The committee names are listed in an earlier section of this report.

The Interview Form. The final task list consisting of 144 tasks was divided into eight major areas of the meat processing industry: kill floor, cutters, boners, curing, wrapping and packaging, sales, sanitation, and management/bookkeeping.

During the personal interview, two sets of data were to be gathered for each task.

1. estimation of importance of each task by identification of employee who performs the task
2. estimation of the frequency of occurrence for each task performed

In identifying the level of importance for each task, the following classifications were used:

1. performed by beginning employees
2. performed by advanced employees
3. performed by manager
4. performed by owner
5. performed by manager/owner

If a job was done by all employees it was assigned to the beginning worker class. By using this method of classification the person who regularly does the job was identified.

Determining the frequency of occurrence for each task was accomplished by using the following classifications:

1. performed daily
2. performed weekly
3. performed monthly
4. performed yearly
5. other (seasonal application only)

In using this manner to classify tasks, those being interviewed were not ladened with trying to estimate the exact amount of time involved with completing each task.

An introductory page was added to the questionnaire to obtain some general information on the business to be interviewed. Name, address and phone number of the business, number of employees in each area, number of new employees in the past year in each area, and the range of salaries paid to employees were the questions that were included on the introductory sheet.

Pre-testing the Interview Form

During the construction of the task list the advisory committee reviewed various phases of development of the list. Tasks were added and deleted until a final draft of the complete task list was attained. The completed list was presented to the committee for a pre-test of the instrument and their approval. The task analysis questionnaire was then pre-tested by personal interview method with a manager-owner of a primary meat processing business. The pre-test was conducted to determine the following:

1. completeness of the task list
2. length of time needed to complete the questionnaire
3. problems that may arise in using the questionnaire
4. terminology was in keeping with that currently used in the industry

Following recommendations of the advisory committee, the wording of some tasks was changed. The task list was then found to be complete and easily understood when utilized in conjunction with the personal interview method.

Identification of Geographic Areas

Upon conferring with the State of Illinois Department of Agriculture, Division of Meat, Poultry and Livestock Inspection, the decision was made

to include only meat processors inspected by the Illinois Department of Agriculture in the primary division and only grocery stores in the secondary division of the meat processing industry. A total of 20 meat processors was to be interviewed. Ten businesses involved in the primary processing operations and 10 involved in the functions of the secondary processor would be used.

The state was divided into five sections using the Illinois Association of Meat Processors and State Department of Agriculture Meat Inspection Regions map. Two primary and two secondary processors were selected from each region based on suggestions from the advisory committee. The counties included in the selection were:

Region I - Stephenson and Winnebago

Region II - Macon, Peoria and Tazewell

Region III - Champaign and Vermillion

Region IV - Cass and Sangamon

Region V - Jackson and St. Clair

Selection of Meat Processors to be Interviewed

The primary meat processors were selected from the May 1979 list of meat processors registered and inspected by the State Department of Agriculture. At that time 483 meat processors were registered for inspection by the state. This list provided the name, address and phone number of the business. It also classified the type of operations each business was involved with. Only those classified as slaughterers and processors were considered for selection. This was to provide the broad range of tasks performed in many specialized areas as well as the more generalized primary meat processing industry.

The secondary meat processors were chosen randomly from grocery stores in each region by the advisory board and the researcher. The only requirement was that at least three persons were employed in the meat department of the grocery store.

After selecting the meat processors, telephone calls were made to introduce the researcher and the project and to secure interview appointments with the manager or owner of each business. Once the interview times were established, letters of confirmation were sent to each meat processor to be visited.

Conducting the Interviews

The interviews were completed in approximately one month. Each interview lasted 15 minutes to one hour. The majority of respondents preferred to read and respond to the questionnaire themselves or have the interviewer mark the list as comments were being made. The most efficient method seemed to be when the respondent and the interviewer read and marked the questionnaire together, discussing and clarifying tasks when necessary throughout the questionnaire. Most processors were eager to have the interviewer tour the business

Results of the Interviews

This part of the report will be divided into two sections. Section one reports the information obtained from personal interviews with primary meat processors. Section two deals with the results of the interviews with secondary meat processors.

Primary processor results. The primary meat processors are regulated by the State of Illinois Department of Agriculture, Division of Meat, Poultry

and Livestock Inspection for intrastate sale of meat products. They have no training programs per se. Each processor trains a beginning worker according to the specific needs of the business, but all beginning workers must learn a common core of tasks. The Amalgamated Meat Cutters and Butcher Workmen of North America have an apprenticeship program for the union. A worker is an apprentice meat cutter or butcher for three years and advances to full meat cutter or butcher status. The task analysis of the primary meat processor revealed the common core of tasks that were required of beginning workers. Table I shows the information gathered for this division.

Secondary processor results. The secondary processing industry, the grocery store meat department, was chosen to represent a large area of a specialty processor. Their products must also be inspected by the State of Illinois Department of Agriculture, Division of Meat, Poultry and Livestock Inspection. Each grocer company has its own apprenticeship program that is completed by the beginning worker. Completion of this program is accomplished in approximately one year. This is a company program and can not be substituted for the three-year Amalgamated Meat Cutters and Butcher Workmen of North America apprenticeship program in the union. The combined information of personal interviews and review of grocer apprenticeship programs revealed a larger, more diverse core of beginner tasks. Table II lists the information gathered from the secondary meat processors.

Organizing Task Data for Curriculum Development

In order to develop a curriculum that would be based on tasks that are most frequently done by entry level employees, the task statements had to be ranked by importance. The task statements for kill floor, cutters,

boners, curing, wrapping and packaging, sales, sanitation, and management/ bookkeeping employees were ranked as:

1. essential tasks
2. important tasks
3. useful tasks
4. tasks which a beginner doesn't need to know

Tasks were classified as essential if 8 to 10 of the processors interviewed in each division classified the task as a beginning task.

A task identified as being done by beginners by 5 to 7 of the 10 processors interviewed was considered as an important task. A task also had to be performed daily by 50 percent of the meat businesses interviewed to be classified as important.

Useful tasks were those identified by 3 to 4 of the processors as a beginning task and performed at least weekly by 50 percent of the meat businesses interviewed.

Tasks listed for beginners by 0 to 2 processors or done less than weekly in 50 percent or more of the businesses were classified as tasks which a beginner does not need to know.

The following tables report the rank of task importance as established through the evaluation of material and information gathered in the interviews.

TABLE I

RANK OF TASK IMPORTANCE

Primary Processors

KILL FLOOR

Essential Tasks

Wear protective clothing
Observe safety precautions
Use proper equipment
Maintain equipment and work area

Important Tasks

Place in cooler (hogs and cattle)

Useful Tasks

Run animal into chute
Split, wash and tag carcass (hogs)

Tasks Which a Beginner Doesn't Need to Know

Cattle:

Remove forefeet
Hang carcass
Open hide down midline and remove
Trim carcass
Open abdominal cavity
Remove paunch, liver, intestines, spleen and stomach
Cut diaphram and remove pluck
Remove head, tail and hind feet
Split, wash and tag carcass
Weigh animal
Immobilize animal
Bleed animal

Hogs:

Put hog in scalding vat and then in dehairer to dehair/skin hog
Remove viscera, toenails and dewclaws
Hang carcass and remove remaining hair by shaving

CUTTERS

Essential Tasks

Maintain knives and all utensils and good sanitation
Observe all safety precautions
Refrigerate and store meats

Important Tasks

Identify primal cuts

Useful Tasks

Trim cuts of beef

Tasks Which a Beginner Doesn't Need to Know

Beef Cut:

Ribs
Short loin
Sirloin
Chuck
Brisket
Plate
Flank
Round
Fore and hind shank
Pull tenderloin

Pork Cut:

Pork loin
Fresh ham
Bacon
Shoulder
Fat back
Jowl

BONERS

Essential Tasks

Use proper sanitation methods
Clean work area
Maintain safety precautions
Grind meat coarsely

Important Tasks

Maintain equipment
Bone all meat for hamburger and sausage
Trim fat from meat
Cube meat for grinding

Tasks Which a Beginner Doesn't Need to Know

Clean heads

CURING CREWS

Essential Tasks

Clean machines, knives, tools, and work area

Important Tasks

Lard rendering:

Collect fat
Grind fat
Place in rendering kettle and set temperature
Remove, strain and place in containers (rendered lard)
Remove cracklings and clean kettle

Curing and smoking bacons and hams:

Unload smoke house
Hang and place in coolers

Sausage:

Grind beef and pork

Useful Tasks

Curing and smoking bacons and hams:

Weigh hams
Separate grades of hams and bacons--remove stockinettes

Sausage:

Place in cutter or chopper
Hang sausage and place in smoke house
Hang sausage to dry
Place sausage in cooler
Clean grinder, chopper, stuffer, work area and tools

Tasks Which a Beginner Doesn't Need to Know

Curing and smoking bacon and hams:

Trim bacon and hams
Bone, shape and trim internal fat from hams
Tie hams and stuff in casings or cryovac
Pump meat with cure or feed cure machine
Check meat for proper injection
Set smoke house schedule, hang hams, insert combs in bacon and put in smoke house
Take internal temperature

Sausage:

Add salt, dextrose and seasoning
Add pork trim and remaining moisture and mix
Transfer to the stuffer
Stuff sausage casing
Set schedule in smoke house
Shut down smoke house and apply steam
Shut off steam and apply cold shower

WRAPPING AND PACKAGING

Important Tasks

Grind hamburger
Patty hamburger for freezing
Wrap meats
Identify meat packages
Fill meat order

Useful Tasks

Slice bacons and hams

SALES
(Wholesale and retail)

Essential Tasks

Clean saws, slicers, scales, blocks and showcase
Keep retail area neat and clean

Important Tasks

Package and freeze meat orders
Be cordial to customers

Useful Tasks

Identify packaged meats
Identify customer's filled order
Notify customer of finished order
File order
Keep in touch with customers regularly
Work cash register
Take and fill meat orders

Tasks Which a Beginner Doesn't Need to Know

Take meat orders
Supervise filling of meat orders
Order extra meat needed

Supervise livestock buying
Arrange transport of livestock
Arrange meat in showcase and keep it stocked
Slice bacon, lunchmeat and ham
Slice loins, roasts, butts and ribs
Crack ribs
Know meat prices

SANITATION

Essential Tasks

Clean:

Slicers
Saws
Knives
Pans
Grinders
Stuffers
Pattying machine
Tables
All utensils
Floors
Work area
Kill floor equipment
Sausage equipment
Fat rendering equipment
Smoke house
Racks, combs and rods
Coolers
Showcase

MANAGEMENT/BOOKKEEPING

Tasks Which a Beginner Doesn't Need to Know

Employee payroll
Employee relations
Tax work
Keep debit/credit books
Banking arrangements
Laundry service arrangements
Order supplies
Maintain sanitation levels
Order meats
Supervise livestock buying and transportation
Schedule processing and meat orders
Maintain customer file and correspondence
Rendering service arrangements for waste products
Supervise various areas and workers
Order spices, casings and various containers

TABLE II

RANK OF TASK IMPORTANCE

Secondary Processors

CUTTERS

Essential Tasks

Maintain knives and equipment
Observe all safety precautions

Important Tasks

Identify primal cuts
Refrigerate and store meats

Beef breaking/cut:

Ribs
Short loin
Sirloin
Chuck
Brisket
Plate
Flank
Round
Fore and hind shank
Pull tenderloin
Trim cuts of beef

Pork breaking/cut:

Pork loin
Fresh hams
Bacon
Shoulder
Fat back
Jowl

BONERS

Essential Tasks

Trim fat from meat
Cube meat for grinding
Maintain safety precautions
Clean work area
Use proper sanitation methods

Important Tasks

Bone all meat for hamburger and sausage
Grind meat coarsely
Maintain equipment

Useful Tasks

Clean heads

WRAPPING AND PACKAGING

Important Tasks

Slice bacon and hams
Grind hamburger
Patty hamburger or package for freezing
Wrap meats
Identify meat packages

Useful Tasks

Fill meat orders

SANITATION

Essential Tasks

Clean:

Slicers
Saws
Knives
Pans
Grinders
Stuffers
Pattying machine
Tables
All utensils
Floor
Work area
Sausage equipment
Coolers
Showcase

SALES

Essential Tasks

Be cordial to customers
Clean saws, slicers, scales, blocks and showcase
Keep retail area neat and clean
Identify packaged meats
Slice bacon, lunchmeat and ham

Important Tasks

Take meat orders
Package and freeze meat orders
Identify customer's filled order
Notify customer of finished order
Keep in touch with customers regularly
Arrange meat in showcase and keep it stocked
Slice loins, butts, roasts and ribs
Crack ribs
Know meat prices
Take and fill meat orders

Useful Tasks

Fill order

Tasks Which a Beginner Doesn't Need to Know

Order extra meat needed

MANAGEMENT/BOOKKEEPING

Important Tasks

Maintain sanitation levels

Tasks Which a Beginner Doesn't Need to Know

Rendering service arrangements for waste products
Order meats
Employee relations

The results of the meat processing purposive study point out that entry-level employees should be knowledgeable of basic skills in all areas of meat processing except management and bookkeeping. The areas of safety, sanitation and proper care of tools were shown by both primary and secondary establishments to be areas of concern. The importance of these duties should be stressed in any training program. Secondary processors expect and demand more from beginning workers than primary processors. The actual tasks of meat preparation are entered into at an earlier time in the secondary processor training program than that of the primary processor.

Presently, vocational curriculum for Illinois high schools is not inclusive of the meat processing industry. There are no vocational schools or technical institutions in Illinois that offer a program in meat cutting or processing. The area is open to development and implementation in the vocational programs in Illinois.

Task Analysis Procedures and Results-- Grain Elevators

Introduction

One important sector of the agribusiness industry is the grain elevator industry. Farmers in the United States are producing more bushels of grain than at any other time in history. As can be evidenced by just a few examples from Crop Production, 1979 Annual Summary, the record 2.27 billion bushel (61.7 million metric tons) soybean crop of 1979 was 21 percent larger than the previous record of 1.87 billion bushels (50.9 million metric tons) produced in 1978. Production of corn for grain established a new record for the fifth consecutive year. Production of corn for grain in 1979 was a record 7.76 billion bushels (197 million metric tons), an

increase of 19 percent above the 1978 wheat crop of 1.80 billion bushels (48.9 million metric tons).

The grain elevator industry is the marketing channel that farmers must rely on to market their record grain harvests. Any grain not fed to livestock must be routed through the marketing channels of the grain elevator industry.

The importance of cash grains in Illinois can be illustrated by the fact that Illinois is a leading grain producing and processing state. A major source of farm income in Illinois is from the sale of grains.

Statement of Problem

Since there are certain competencies required of entry level and advanced level employees in the grain elevator industry in Illinois, and there exists a shortage of competent workers, the problem is to determine what should be taught to potential workers of this industry.

Research Questions

1. What competencies are required of the entry level employee in the grain elevator industry in Illinois?
2. What competencies are required of the advanced level employee in the grain elevator industry in Illinois?
3. What competencies are required of the management level employee in the grain elevator industry in Illinois?
4. What types of grain elevators exist in Illinois?
5. What is the present means of training workers for the grain elevator industry in Illinois?

Significance of Problem

The identification and validation of competencies needed by entry level and advanced level employees in the grain elevator industry in Illinois is

useful to secondary and post-secondary schools in Illinois. Schools may utilize these competencies to establish technical or vocational training programs to supply the grain elevator industry in the state of Illinois with a source of competent employees. The acquisition of competent entry level and advanced level employees in this industry is presently a severe problem (Hoeman, 1980). These competencies would also be useful to teachers in placing students in supervised occupational experience programs or cooperative occupational education programs when utilizing the grain elevator industry in Illinois as training stations. This information would aid teacher education departments to up-date their curricula for preparing teachers and in preparing competency examinations for prospective teachers of agricultural occupations.

Limitations

1. This study considers only the grain elevator industry in the state of Illinois and grain elevators that are classified below the terminal elevator level, known as country elevators. However, the findings of this study may be extrapolated for grain elevators found throughout the middle United States.
2. Grain elevators were classified by size according to individual grain elevator bushel capacity.
3. Competencies for entry level and advanced level employees were validated by managerial level employees.
4. No research has been done to determine if a curriculum based on the competencies found by this study will provide competent workers.
5. Sixteen randomly sampled country grain elevators were chosen as a representative sample of the entire country grain elevator industry.

Definition of Terms

The following operational definitions were used for this study:

Grain Elevator: Specifically those categorized below the terminal elevator. Commonly referred to as a country elevator and as listed by the Grain and Feed Association of Illinois, 1979-80 designated by the initials G.E. in the Annual Directory.

Entry Level Employee: An employee usually, but not limited to, who has less than one full year experience on the job; requires close supervision.

Advanced Level Employee: An employee usually, but not limited to, having at least more than one full year of on-the-job experience; requires little supervision.

Multiple Elevator: A grain elevator that transacts business and/or stores grains at more than one location, but still under the control of a parent office.

Single Elevator: A grain elevator that transacts business and/or stores grains at only one location under the control of a parent office at the same location.

Large Grain Elevator: A grain elevator with more than 1,000,000 bushel total storage capacity.

Medium Grain Elevator: A grain elevator with at least 100,000 but less than 1,000,000 bushel total storage capacity.

Small Grain Elevator: A grain elevator with less than 100,000 bushel total storage capacity.

Terminal Elevator: A grain elevator normally located at major railroad centers of the midwest. They provide a cash market for grain consignments made by country and subterminal elevators, agents, dealers, and brokers (Wills, 1972).

Review of Grain Elevator Curriculum Materials

An extensive search was made to locate related studies concerned with developing worker competencies in agricultural occupations. Many studies were found that had determined a common core of competencies that were needed by workers throughout most sectors of the agribusiness industry, but none that dealt with the technical competencies required of country grain elevator workers.

Developing the Task List and Interview Form

The task list used in this study was compiled by using several different sources. The United States Department of Labor's Dictionary of Occupational Titles (1977), A Model for Task Analysis in Agribusiness (1971), and consultation of an advisory committee.

A total of 127 tasks was divided into six major areas of the country grain elevator industry: Production, Office, Sales, Safety, Management, and Maintenance.

By presenting each task at the interview two sets of data were to be gathered:

1. estimation of frequency of occurrence of each task performed, and
2. importance of each task determined by identifying the person who normally performs the task

In determining the frequency of occurrence of each task, the following classifications were used:

1. performed daily
2. performed weekly
3. performed monthly
4. performed yearly
5. other (seasonal application only)

By classifying tasks in this manner, those being interviewed were not burdened with trying to estimate the exact amount of time involved with each task, such as hours per day.

In defining the importance level of each task, the following classifications were used:

1. performed by beginning employees
2. performed by advanced employees
3. performed by manager
4. performed by owner
5. performed by manager/owner

By using this classification, the person who normally performs the task was identified.

An introductory page was added to the questionnaire to obtain some general information on the business to be interviewed. The introductory page of the questionnaire included name, address, and phone number of business, number of employees in each area, number of new employees in the past year in each area, and the range of salaries paid to employees in each area.

Pre-Testing the Interview Form

The task analysis questionnaire was pre-tested by allowing the manager of a medium size grain elevator to review it and by presenting the interview form to the advisory committee for their recommendations.

Selection of Grain Elevators to be Interviewed

Upon recommendation of the advisory committee 16 grain elevators were selected to be interviewed. The state of Illinois was divided into four regions; four elevators were selected from each region. The counties included in the random selection were:

Region I: Boone, Lee, Henry, and Rock Island

Region II: Stark, Logan, and Morgan

Region III: Effingham, Crawford, Piatt, and Shelby

Region IV: Williamson and Washington

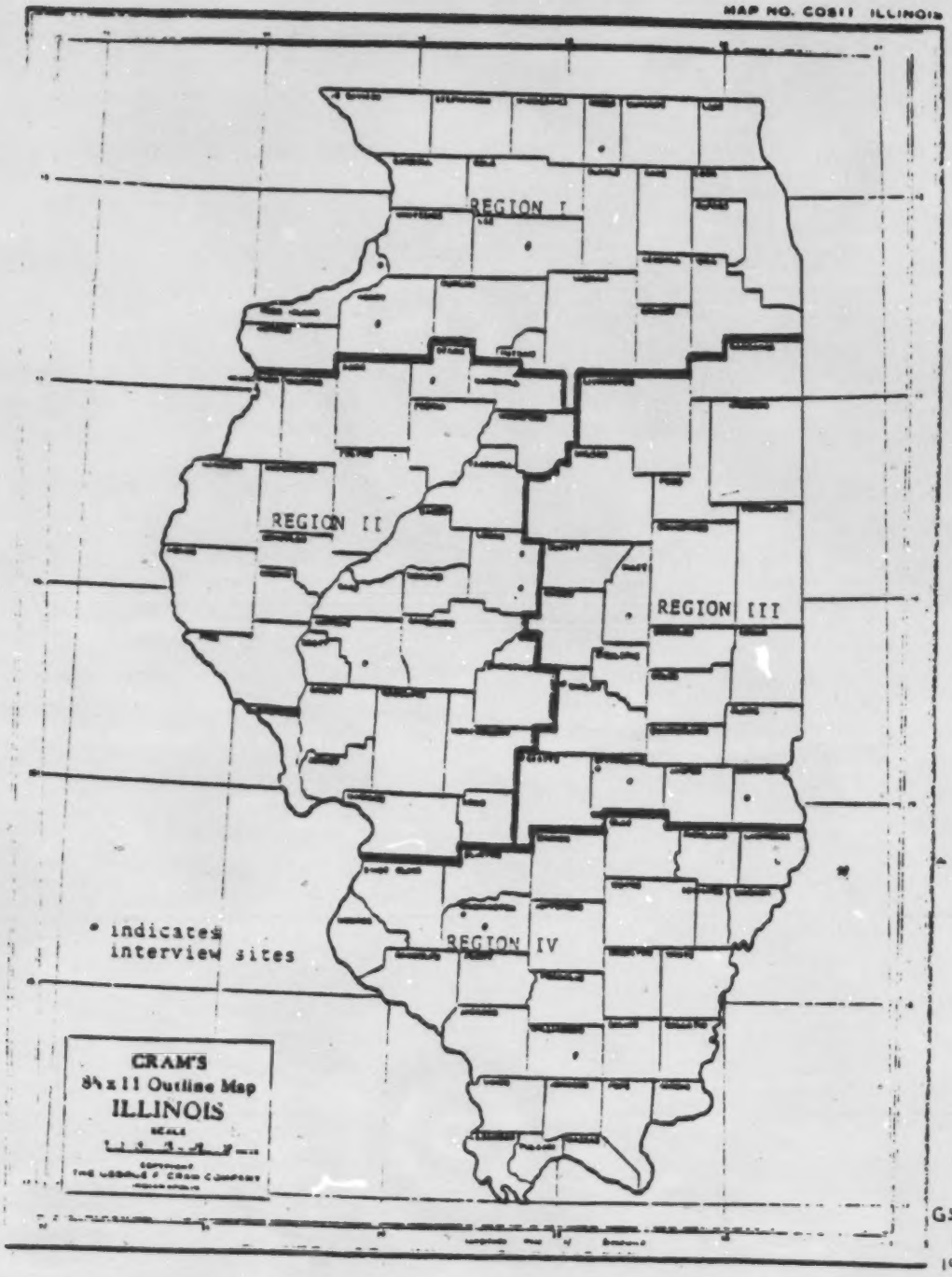


Figure 3. Regional division of state

The country grain elevators were selectively chosen from the 1976-1977 Annual Directory of the Grain and Feed Association of Illinois. Only those elevators which were listed with the abbreviation G.E. (grain elevator) were considered for selection. The use of country grain elevators that are members of the Grain and Feed Association of Illinois insured the selection of reputable business people. The committee was used to select elevators in the randomly chosen regions. The committee was asked to select a representative and cooperative business.

After selecting the country grain elevators, telephone calls were made to establish interview appointments. Once interview appointments were set up, a letter of confirmation was sent to each grain elevator.

Conducting the Interviews

The interviews were completed during a time period of approximately one month. The duration of each interview ranged between 20 minutes to one hour depending on the responsiveness of the person being interviewed. The majority of the respondents completed the interview form themselves, while two respondents read along with the interviewer and gave responses. The respondents who completed the interview form themselves, asking questions when clarification was needed, seemed to be the most efficient method.

Summary of the Interviews

The task analysis system provided the frequency of time spent performing each task, the importance of the task, and who performs the task. While the tasks performed at single and multiple elevators are the same, the type of employee responsible for certain tasks may not be the same.

The personnel interviewed also indicated a shortage of competent workers available for employment in the grain elevator industry. Those interviewed expressed concern for the need of trained competent workers. Presently there does not exist a formal means of training individuals for employment in the grain elevator industry in Illinois.

Organizing Task Data for Curriculum Development

In order to develop a curriculum which would be based on tasks that are most frequently performed by beginning employees, the task statements had to be ranked by importance. The task statements for production, office, sales, safety, management, and maintenance were ranked as (1) essential tasks, (2) important tasks, (3) useful tasks, and (4) utility tasks.

Tasks were classified as essential if at least 87.5 percent of the grain elevators interviewed classified the tasks as a task performed by a beginning worker.

Tasks were classified as important tasks if at least 62.5 percent but less than 87.5 percent of the grain elevators interviewed classified the tasks as a task performed by a beginning worker.

Tasks were classified as useful tasks if at least 50 percent but less than 62.5 percent of the grain elevators interviewed classified the tasks as a task performed by a beginning worker.

Tasks were classified as utility tasks if less than 50 percent of the elevators interviewed classified the tasks as a task performed by a beginning worker.

Since portions of the grain elevator industry function on a seasonal basis, a task needed to be performed daily or as needed by 50 percent of the grain elevators interviewed to be included in the ranking for beginning workers.

Tables III and IV list the rank of task importance for the beginning worker provided by the data obtained from interviewing 16 country grain elevators in Illinois.

The findings of the grain elevator purposive study indicate that a set of competencies for entry and advancement in the grain elevator industry in Illinois does exist. The competencies required for employees of grain elevators are basically the same for single or multiple elevators. The frequency at which employees perform certain tasks at single elevators is synonomous with the frequency of occurrence at multiple elevators. Since there exists little difference between the frequency or importance of the tasks performed at single or multiple elevators, an employee trained for a single or multiple elevator would also be able to perform well at a multiple elevator and vice versa.

At the present time, vocational curriculums utilized by Illinois high schools, community colleges and senior institutions do not encompass the grain elevator industry. There exists no vocational or technical program in the state of Illinois that trains individuals in the operation of a grain elevator.

TABLE III
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
SINGLE ELEVATORS

Production Tasks
Essential Tasks:
Draw a representative sample of grain from a truck or car
Clean grain bins
Important Tasks:
Load grain into cars or trucks for shipment
Utility Tasks:
Compute weight loss incurred in drying grain
Identify weeds commonly found in crops grown locally
Identify weed seeds commonly found in crops grown locally
Weigh grain as it arrives at the elevator
Weigh trucks as they leave the elevator
Operate seed treating equipment
Operate seed cleaning equipment
Use balances, moisture testers, screens, and dockage machines used in grading grain
Operate devices for detecting "hot spots" in stored grain
Grade grain according to USDA Grain Standards Act
Blend various qualities of grain to meet grade
Control rodents
Drive big trucks (class C operators license preferred)

Office Tasks
Essential Tasks:
Use adding machine and/or other tabulating devices in balancing accounts
Important Tasks:
Perform typing and mailing tasks

TABLE III
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
SINGLE ELEVATORS
(cont.)

Office Tasks
(cont.)

Utility Tasks:

Take orders for sales or service by telephone
Answer customer inquiries by telephone
Verify customer addresses using directories
Keep records of receipts and expenses
Make out and mail bills to collect accounts due
Perform filing tasks
Check credit references of customers
Keep employee work records
Pay accounts payable
Keep customer credit records
Check received grains against invoice listings
Check invoices for math errors

Sales Tasks

Essential Tasks:

Prepare scale tickets

Important Tasks:

Write up sales tickets

Utility Tasks:

Quote grain prices to farmers
Prepare purchase orders
Quote grain prices to buyers
Calculate current storage cost
Quote current dockage rates to clientele
Follow up grain purchases and sales to determine customer satisfaction
Prepare advertising materials
Solicit sales by telephone
Solicit purchases by telephone

TABLE III
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
SINGLE ELEVATORS
(cont.)

Safety Tasks

Essential Tasks:

Operate fire extinguishing equipment
Memorize fire department's phone number

Important Tasks:

Obtain and comply with OSHA requirements for such things as grain dust control, power shields, ladders, lighting, etc.
Obtain and comply with E.P.A. regulations for grain dust control

Management Tasks

Utility Tasks:

Obtain reasons for dockage and be familiar with grain industry standards
Obtain market prices
Effectively communicate with all clientele; e.g., farmers, truckers, grain dealers, etc.
Obtain reasons for grain damage and how to prevent it; e.g., auger damage, drop damage, use of drags to prevent damage, etc.

Maintenance Tasks

Essential Tasks:

Keep work, storage, and delivery areas neat and clean
Paint buildings and equipment when needed
Keep all tools clean and properly stored
Clean grounds of leaves and litter
Mow and trim lawns
Shovel snow
Repair driveways

TABLE III
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
SINGLE ELEVATORS
(cont.)

Maintenance Tasks
(cont.)

Important Tasks:

Perform light maintenance of business vehicles; e.g., oil level, tire pressure, battery and radiator water levels, other fluid levels, etc.
Perform minor carpentry repairs; e.g., doors, siding, fences, etc.
Operate snow removal equipment
Grade driveways

Useful Tasks:

Change oil and grease business vehicles

Utility Tasks:

Perform minor tune-up of business vehicles by replacement of spark plugs and ignition points
Repair electrical light switches and extension cords
Clean and oil electric motors
Grease all bearings periodically on equipment
Order repair parts for all equipment
Maintain and repair small gasoline engines
Repair and/or replace V-belts and drive chains
Replace electrical fuses
Spray chemicals to control weeds and insects around grounds
Fill to proper level all gear boxes with gear oil

TABLE IV
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
MULTIPLE ELEVATORS

Production Tasks

Essential Tasks:

Draw a representative sample of grain from a truck or car
Clean grain bins

Important Tasks:

Weigh grain as it arrives at the elevator
Weigh trucks as they leave the elevator
Load grain into cars or trucks for shipment

Useful Tasks:

Use balances, moisture testers, screens, and dockage machines used in grading grain

Utility Tasks:

Compute wieght loss incurred in drying grain
Properly label seed samples
Identify types of grain damage (B.C.F.M.)
Identify materials that my contribute to odor contamination of grain
Observe concentration of insects in grain
Operate seed cleaning equipment
Operate devices for detecting "hot spots" in stored grain
Grade grain according to USDA Grain Standards Act
Control rodents
Drive big trucks (class C operators license preferred)

Office Tasks

Important Tasks:

Verify customer addresses using directories
Perform filing tasks
Use adding machine and/or other tabulating devices in balancing accounts

TABLE IV
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
MULTIPLE ELEVATORS
(cont.)

Office Tasks
(cont.)

Useful Tasks:

Perform typing and mailing tasks

Utility Tasks:

Take orders for sales or service by telephone
Answer customer inquiries by telephone
Keep records of receipts and expenses
Make out and mail bills to collect accounts due
Check credit references of customers
Keep employee work records
Pay accounts payable
Keep current inventory of grain stocks for sale and grain stocks stored for customers
Check received grains against invoice listings
Check invoices for math errors

Sales Tasks

Useful Tasks:

Write up sales tickets

Utility Tasks:

Quote grain prices to farmers
Prepare scale tickets
Prepare bills of lading
Prepare purchase orders
Calculate current storage costs
Follow up grain purchases and sales to determine customer satisfaction
Identify customer needs and wants
Solicit sales by telephone
Solicit purchases by telephone

TABLE IV
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
MULTIPLE ELEVATORS
(cont.)

Safety Tasks

Essential Tasks:

Operate fire extinquishing equipment
Memorize fire department's phone number

Utility Tasks:

Obtain and comply with OSHA requirements for such things as grain dust control, power shields, ladders, lighting, etc.
Obtain and comply with E.P.A. regulations for grain dust control

---

Management Tasks

Utility Tasks:

Obtain reasons for dockage and be familiar with grain industry standards

---

Maintenance Tasks

Essential Tasks:

Keep work, storage, and delivery areas neat and clean
Paint buildings and equipment when needed
Keep all tools clean and properly stored
Clean grounds of leaves and litter
Mow and trim lawns
Shovel snow

TABLE IV
RANK OF TASK IMPORTANCE FOR BEGINNING WORKER
MULTIPLE ELEVATORS
(cont.)

Maintenance Tasks
(cont.)

Important Tasks:

Perform light maintenance of business vehicles; e.g., oil level, tire pressure, battery and radiator water levels, other fluid levels, etc.
Change oil and grease business vehicles
Grease all bearings periodically on equipment
Repair driveways

Useful Tasks:

Perform minor carpentry repairs; e.g., doors, siding, fences, etc.

Utility Tasks:

Perform minor tune-up of business vehicles by replacement of spark plugs and ignition points
Repair electrical light switches and extension cords
Clean and oil electric motors
Maintain and repair small gasoline engines
Repair and/or replace V-belts and drive chains
Replace electrical fuses
Spray chemicals to control weeds and insects around grounds
Operate snow removal equipment
Grade driveways
Fill to proper level all gear boxes with gear oil

Testing the Self-Instruction Guide

Involving teachers. Letters were sent to 206 Illinois horticulture teachers informing them that a course titled "Curriculum Development in Horticulture" would be offered in the spring of 1980. Those teachers who returned the questionnaire were then contacted by telephone to see if they were able to attend three class sessions being offered at five locations throughout the state--Collinsville, Beardstown, Champaign, South Holland, and Naperville. Course information was sent to those teachers who indicated they would participate in the class.

SIU

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

To: Illinois High School Horticulture Teachers

From: James W. Legacy
Amy C. Swigart
Agriculture Education

Re: "Curriculum Development in Horticulture"

Currently there is a shortage of validated horticultural teaching materials in Illinois. Many teachers are faced with the problem of developing their own materials. Southern Illinois University can help you develop competency based teaching materials. We will be offering a course titled "Curriculum Development in Horticulture". This course will assist you in developing teaching materials based on valid industry competencies.

The course will be offered at a central location, and three hours of graduate or undergraduate credit can be earned through the Department of Agricultural Education or the College of Education. In addition to the course, there are positions for 15 people to participate in a task analysis of the horticultural industry. These 15 people will be paid up to $200 for their consultant services.

Please complete the enclosed questionnaire and return it in the self-addressed envelope. Your input will allow us to structure the course to meet your specific needs. Your cooperation and participation is appreciated.

Enclosure: questionnaire
return envelope

QUESTIONNAIRE
COMPETENCY-BASED CURRICULUM

1. Name_____

2. Your School_____

3. Name(s) of additional Hort. staff at your school_____

4. Would you participate in the "Curriculum Development in Horticulture" course:

   _____for 3 hours credit _____non-credit

   _____No, I am not able to participate at this time*

5. How many years have you taught horticulture?

6. How many classes of horticulture do you teach daily? _____

7. In what areas of horticulture do you teach?

   _____Floriculture _____Nursery Production & Management

   _____Greenhouse Management _____Turf & Grounds Maintenance

   _____Landscape Horticulture _____Vegetable Production

   _____Fruit Production _____Other (specify)

8. In what areas of horticulture do you have work experience?

   _____Floriculture _____Nursery Production & Management

   _____Greenhouse Management _____Turf & Grounds Maintenance

   _____Landscape Horticulture _____Vegetable Production

   _____Fruit Production _____Other (specify)

9. Would you participate as a horticulture consultant?

   _____Yes _____No

10. When would you prefer the course to meet?

    _____Fall, 1979 _____Spring, 1980

11. Would you prefer the course to meet:

    _____4 weekends - 6 hrs. meeting time per weekend

    _____8 selected dates - 3 hrs. meeting time per day

PLEASE COMPLETE AND RETURN -- THANK YOU

*Please return questionnaire even though you are not able to participate.

Name_____

Date_____

Time_____

TELEPHONE SCRIPT

Name of class member_____

High School_____

Phone #_____

Is _____ in class? _____
(If yes, fill in information in box)

When would be a good time to reach him/her?_____

Could I leave a message?

Message

Please call me collect about the curriculum development in horticulture class. The phone # is 618-536-7733.

This is _____ from Agricultural Education & Mechanization at SIU-Carbondale. You expressed interest in participating in a course dealing with Curriculum Development in Horticulture by completing a questionnaire for us in September. This course will assist you in developing teaching materials based on valid industry competencies.

CLASS INFORMATION

The class will meet three times during the spring semester. Each session will be three hours in length. The class can be taken for 3 hours of undergraduate or graduate credit or for non-credit. The SIU registration fee for 3 hours of credit is $72 and there is no charge for taking the course for non-credit.

The course will be offered at 5 locations throughout the state. The locations are: Collinsville, Beardstown, Champaign, Naperville and Chicago.

The 3 sessions will be held during these weeks:

1st session - January 7-19

2nd session - March 3-15

3rd session - April 21-May 3

Are there any days during these weeks on which you could not attend?

Previous conflicts_____

When do you prefer the evening meetings?

Time of evening meeting 3-6_____

7-10_____

other_____

We will be sending you more information in the near future.

CONSULTANTS ONLY

You have been chosen as a consultant. Consultants will be paid on the following basis and will be required to:

Interview 3 progressive businesses -	$50 per interview
Attend the 3 class meetings - (not necessarily for the whole 3 hours)	$50
	$200 Total

We would like for you to work in the horticultural area of _____

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

November 16, 1979

TO: Curriculum Development in Horticulture
Class Participants

FROM: James W. Legacy
Amy C. Swigart
Agricultural Education

RE: Curriculum Development in Horticulture Class

Southern Illinois University will be offering a course dealing with the topic of Curriculum Development in Horticulture during the spring of 1980 (see attached course outline). This course consists of 3 class sessions and will be offered at 5 locations throughout the state of Illinois. These locations were selected due to their central location to interested class participants. The 3 class sessions will meet from 6:30-9:30 p.m. on the following dates at these locations:

Naperville North High School Room #178 Mill Street & Ogden Avenue Naperville, IL 60540	1st session - Tuesday, January 15 2nd session - Tuesday, March 4 3rd session - Tuesday, May 6
Thornwood High School Room #B209 171 Street & South Park South Holland, IL 60473	1st session - Monday, January 14 2nd session - Monday, March 3 3rd session - Monday, May 5
Central High School Agriculture Room 114 610 West University Champaign, IL 61820	1st session - Monday, January 7 2nd session - Monday, March 10 3rd session - Monday, April 28
Beardstown High School Agriculture Room #7 200 East 15th Street Beardstown, IL 62618	1st session - Tuesday, January 8 2nd session - Tuesday, March 11 3rd session - Tuesday, April 29
Collinsville Area Voc. Center Room 119 2201 West Morrison Collinsville, IL 62234	1st session - Thursday, January 10 2nd session - Thursday, March 6 3rd session - Thursday, May 1

CREDIT

The Curriculum Development in Horticulture course can be taken for 3 semester hours of undergraduate credit, graduate credit, or for non-credit. Participants wanting to take the course for credit may register by using either of the following course numbers:
VES 494A - offered through Vocational Education Studies Department
AGEM 581A- offered through Agricultural Education & Mechanization Dept.
Registration will be held at the first class meeting at each location. A certificate of completion will be given to non-credit participants. Those wishing to take the class for credit will be expected to devote 40 hours in class and class-related activities.

COST

There is no registration fee for this course. For those wishing to take the course for 3 semester hours of credit, the tuition cost is $72. Tuition can be paid at the first class session. VISA may be used for payment of tuition.

Curriculum Development in Horticulture

TOPICS TO BE COVERED

SESSION I: LEARNING THE COMPETENCY-BASED WAY

This session will serve as an introduction to the competency based way. Class participants will complete the eight steps of Developing Competency-Based Teaching Materials.

SESSION II: WRITING THE COMPETENCY-BASED WAY

In the second session, class participants will convert industry analysis into competency-based curriculum. Each participant will write a small competency-based teaching unit in an area of horticulture.

SESSION III: TEACHING THE COMPETENCY-BASED WAY

The third session will enable the teacher to incorporate competency-based teaching materials into the classroom. Special emphasis will be placed on learning activities and evaluation.

If you have any questions or concerns about this course, feel free to contact:

Amy Swigart or James Legacy
Agricultural Education & Mechanization
Southern Illinois University
Carbondale, Illinois 62901
Telephone: 618-536-7733

Conducting classes. The initial class session was used to acquaint teachers with the course syllabus and assignments. Teachers were instructed to select a chapter and develop the teaching content. Each chapter had a validated task list which was to be included in the content matter. Teaching aids--quizzes, student skill check lists, visual aids, student activities--were to be included with each completed chapter.

The second class centered around the development of teaching content through knowledge and skill statements. Sample statements were sent to all students prior to this meeting to aid them in the preparation of their assignments.

Students were asked to submit their final teaching content to the coordinating staff prior to the last class meeting so the materials could be edited for the critique session. Teaching aids were asked to be included so the copies could be evaluated in a finished format. Lastly, teachers were asked to evaluate three other chapters--content and teaching activities.

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

TO: Horticulture Curriculum Class Members

FROM: Jim Legacy, Terry Savko, Fred Reneau

RE: Selection of Unit or Chapter Title and Assignment 'A'

We have reviewed the Unit/Chapter titles selected by members of the class and would like you to write instructional materials for Unit ____ in the _____ area of horticulture.

Enclosed is our review of your assignment 'A'. The list of tasks in your chapter should be used to complete assignment 'B'. Assignment 'B' (page 113) involves writing skill and knowledge statements for each task in your chapter. Please read pages 92-112 prior to writing skill and knowledge statements. You may also want to refer to page 144 of the syllabus to review a completed chapter's skill and knowledge statements. We are asking you to complete assignment 'B' and return it to us by February 2. We will review assignment 'B' and send it back to you with information concerning 'C', 'D' and 'E'.

If you have any questions concerning this effort, please call Terry Savko at 800-642-5337 extension 258.

hcd

Enc.

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

February 8, 1980

TO: Horticulture Curriculum Class Members

FROM: Jim Legacy, Terry Savko, Fred Reneau

RE: Writing content for chapters; Assignments C, D, and E

We have read assignment 'B' and have organized outlines of each chapter. The chapter outline consists of skill statements, simple knowledge statements and complex knowledge statements. After talking with several of you, we have decided to change the decision statement name to complex knowledge statements. Please read the enclosed definition and example of these three statements.

Also enclosed is our review of your assignment 'B'. The list of skill statements, simple knowledge statements and complex knowledge statements should be used to complete assignments C, D, and E. To complete these assignments, we are asking you to complete each skill statement by listing the proper steps in performing each skill and to list any key points which will assist in performance of the skill.

Also for each simple knowledge statement, please provide the answer to the question which is implied by the simple knowledge statement. Or, put another way, what should the student be expected to know about each simple knowledge statement?

Lastly, for each complex knowledge statement, list the probable correct solutions to the implied questions and list the factors which would affect the selection of the best answer.

Again, if you have any questions concerning this assignment, please call Terry Savko at 800-642-5337, extension 258.

Concerning the next class meeting times, we are planning to meet at the following times and places:

Collinsville - Thursday, March 6	Thornwood - Monday, March 17
Champaign - Monday, March 10	Naperville - Tuesday, March 18
Beardstown - Tuesday, March 11	

To assist us in preparing for the second class, would you please return to us, by March 1st, a sample of your completed skill statements, simple and complex knowledge statements. Terry has noted sample statements which you may wish to send to us by March 1st. If you will do this, it will greatly help us as we prepare to meet with you in mid-March.

Thus far we have been greatly pleased with your efforts and realize many of you have spent long hours on the project.

WRITING CONTENT FOR COMPETENCY BASED INSTRUCTION

The next step in writing your competency based curriculum unit is writing the content for your skill and knowledge statements.

Skill statements are the psychomotor or performance elements that are needed to perform the task successfully. Every skill statement should show <u>action</u>, thus the use of an action verb. By including action in the skill statements the student will actually perform the skill instead of discussing or observing the skill. Skill statements are followed by the actual steps and key points to be aware of while performing the skill. When writing skill steps, try to avoid overusing general verbs such as perform and do. Use meaningful verbs that can be applied directly to the skill.

SKILL STATEMENT EXAMPLE

Skill Statement - Wash car	
<u>Steps</u>	<u>Key Points</u>
1. Close all windows	
2. Gather & prepare all materials	2. Bucket, soap & water, sponge, chamois
3. Wash vehicle	
4. Rinse vehicle	
5. Dry car	5. Do windows first, then rest of car

Knowledge statements are the intellectual or cognitive elements that need to be learned in order for the student to perform the task successfully. They contain information that a student needs to know in order to apply and complete the skill. Knowledge statements are most useful when they are specific and detailed.

There are two types of knowledge statements: simple and complex. A simple knowledge statement has a specific answer for the implied question.

SIMPLE KNOWLEDGE EXAMPLE

$Knowledge_1$	Two longest rivers in the U.S. A. Mississippi River B. Missouri River	answers the implied question:- What are the 2 longest rivers in the United States?

A complex knowledge statement is also known as a decision statement. It is similar to a simple knowledge statement in that it also answers a question. But as the factors of a particular situation change, so may the options for the answer vary. An answer is determined by considering the available alternatives in relation to the factors which affect the situation. Thus, there is not one specific answer for a decision statement. It must meet the needs of that particular situation.

COMPLEX KNOWLEDGE EXAMPLE

Task - Auto Sales

Skill Statement - Selling a car

Knowledge statement - Customer needs — answers the implied question: What are the customer needs?

Decision statement - Which car to advise customer to purchase?

Alternatives	Factors
1. Used 2 yr. old compact	1. Customer use
2. Used 10 yr. old full-size sedan	2. Cost of car
3. New subcompact	3. Condition of car
	4. Maintenance cost

The student outcomes from a decision statement lesson are to have the student:

1. learn the alternatives
2. learn the factors, and
3. know how to use the factors and alternatives when solving a particular problem.

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

April 15, 1980

TO: Horticulture Curriculum Class Members

FROM: Jim Legacy, Terry Savko, Fred Reneau

RE: Writing Activities for Chapter; Assignments F, G, and H

We have read assignments F, G, and H and have organized content for each chapter. It is very apparent that many have spent extra time in developing good chapter content.

Prior to the last class meeting we are asking you to complete assignments F, G, and H. The guidelines for these assignments follow. I believe you will find these assignments less time consuming yet important, as they express your experience in planning successful teaching episodes.

Assignment F, page 128; please complete 10 knowledge questions which are representative of a short overview written evaluation of your chapter content. Also complete one skill score card for one of the skills of your chapter.

Assignment G; AV and worksheet - please complete the sketch of an overhead or complete a worksheet which would be used for teaching your chapter.

Assignment H; Activity - please complete either a general discussion activity or a specific result activity plan for teaching your chapter. See general discussion activity sample, pages 134-135 and specific discussion activity sample, pages 136-138.

Please complete assignments F, G, and H prior to the final class. Also, if possible, send us a copy of these assignments a week prior to class. If you can do this, it will greatly facilitate our planning for the last class.

Lastly, at the last class you will be asked to evaluate 3 other chapters - content and teaching activities, Assignment I, page 141.

Concerning the last class meeting times, we are planning to meet from 6:30-9:30 p.m. at the following locations:

Champaign, Monday, April 28
Beardstown, Tuesday, April 29
Collinsville, Thursday, May 1
Thornwood, Monday, May 5
Naperville, Tuesday, May 6

Summary of teacher use of competency based guide. The workshop participation of 42 Illinois vocational horticulture teachers resulted in competency based instructional materials. A summary of the materials prepared by the teachers follows this paragraph. A sample of the material prepared by teachers can be found in Appendix F.

Landscape/Nursery

1. Tree Identification - 6 pg. Teaching Content, Matching Quiz, Woody Plant Identification Key, Visual Aids, Student Activities
2. Developing a Landscape Plan - 5 pg. Teaching Content, Quizzes (2 matching, multiple choice, short answer), Student Skill Check List, Visual Aid, Student Activity
3. Implementing the Landscape Plan - 23 pg. Teaching Content, 5 Quizzes (T/F, multiple choice, fill in the blank, matching) 2 Student Skill Check Lists, Visual Aids, Student Activities
4. Maintaining the Landscape - 15 pg. Teaching Content, Quizzes (T/F, fill in the blank, matching), Student Skill Check List, Student Activities, Visual Aids
5. Propagation - 35 pg. Teaching Content, Quizzes (T/F, multiple choice, matching, 5 short answer), 2 Student Skill Check Lists, Visual Aids, Student Activities
6. Equipment Maintenance - 25 pg. Teaching Content, 2 Quizzes (matching), Student Skill Check Lists, Visual Aids, Student Activities

Greenhouse Production and Management

1. Controlling the Greenhouse Environment - 14 pg. Teaching Content, Quiz (multiple choice and fill in the blank), Student Skill Check List, Visual Aids, Student Activities and Worksheets
2. Greenhouse Soils - 8 pg. Teaching Content, 2 Quizzes (matching, fill in the blank), Visual Aids, Student Activities
3. Foliage Plants - 10 pg. Teaching Content, Flowering Plant Key, Quizzes (matching, fill in the blank), Student Skill Check List, Visual Aids, Student Activities
4. Propagation - 8 pg. Teaching Content, Quiz (fill in the blank, T/F, short answer), Visual Aids, Student Activities

5. Sales - 21 pg. Teaching Content, Quiz (short answer), 2 Student Skill Check Lists, Student Activity, Visual Aids.

6. Cut Flower Production - 19 pg. Teaching Content, Visual Aids, Student Activity

7. Bedding Plants - 4 pg. Teaching Content, Quiz (matching, fill in), Student Skill Check List, Visual Aids, Student Activities

Turf and Lawn Services

1. Identification of Turf Grasses - 11 pg. Teaching Content, Quizzes (fill in the blank, T/F, matching, short answer), Student Skill Check List, Visual Aids, Student Activities

2. Soils and Fertilizers - 8 pg. Teaching Content, 3 Quizzes (matching and short answer), Student Skill Check List, Visual Aids, Student Activities

3. Planting Turf Grasses - 17 pg. Teaching Content, 2 Quizzes (matching and fill in the blank), Student Skill Check List, Visual Aids, Student Activities

4. Insects and Diseases - 8 pg. Teaching Content, Quiz (multiple choice), Student Skill Check List, Visual Aids, Student Activities

Vegetable Production

1. Identification of Cool Season Vegetables - 6 pg. Teaching Content, Quiz (short answer), Student Skill Check List, Visual Aids, Student Activities

2. Identification of Warm Season Vegetables - 37 pg. Teaching Content, Quiz (fill in, matching, multiple choice, T/F), Student Skill Check List, Visual Aids, Student Activities

3. Seed Propagation - 6 pg. Teaching Content, Quic (T/F, fill in the blank), Student Skill Check List, Visual Aid, Student Activity

4. Vegetable Production - 9 pg. Teaching Content, Quiz (short answer, fill in the blank, matching), Visual Aids, Student Activities

5. Insects, Diseases, and Weeds - 18 pg. Teaching Content, 2 Quizzes (fill in the blank, multiple choice, matching, short answer), 2 Student Skill Check Lists, Visual Aids, Student Activities

Fruit Production

1. Fruit Production - 6 pg. Teaching Content, Quiz (matching), Visual Aids, Student Skill Check List.

REFERENCES

Bailey, J. W. Encyclopedia of labeling meat and poultry products. Meat Plant Magazine, St. Louis, Missouri, 1974.

Berkley, A. L. The functions-task analysis method of determining behavioral objectives for occupational education. The Journal of the American Association of Teacher Educators in Agriculture 14(1):20-25, 1973.

Boeckman, R. E. Safety provisions and procedures in the meat packing industry. Unpublished masters thesis, Southern Illinois University-Carbondale, 1961.

California, Bureau of Industrial Education. Course in meat cutting. Sacramento, California State Department of Education, 1948.

Carter, R. I. & Crawford, H. R. What professional competencies are needed by beginning teacher educators in agricultural education? The Journal of the American Association of Teacher Educators in Agriculture 18(2):19-24, 1977.

Clemen, R. A. The American livestock and meat industry. New York: The Ronald Press Co., 1923.

Doubet, C. B. Cattle and hog production and slaughter trends in the United States. Unpublished masters thesis, Southern Illinois University-Carbondale, 1965.

Halfin, H. & Nelson, O. A practical curriculum development system. Man/Society/Technology, 35(8):246-248, 1976.

Horner, J. T. & Zickmund, D. G. Comprehensive programs based on competencies rather than content areas for agricultural employees. The Journal of the American Association of Teacher Educators in Agriculture 11(2):11-20, 1970.

Illinois, Division of Meat, Poultry and Livestock Inspection. Meat and poultry inspection act with regulations. Springfield, Illinois.

Jensen, L. B. Meat and meat foods. New York: The Ronald Press Co., 1949.

Kramlich, W. E. Processed meats. Westport, Conn.: AVI Publishing Company, Inc., 1973.

Lawrie, R. A. Meat science. Oxford, N.Y.: Pergamon Press, 1974.

Legacy, J.W. & Bennett, F. A comparison of the mailed questionnaire and personal interview methods of data collection for curriculum development in vocational education. The Journal of Vocational Education Research 4(3):27-39, 1979.

Legacy, J. W. Identifying technical teacher competencies in agricultural education. The Journal of the American Association of Teacher Educators in Agriculture 18(1):22-26, 1977.

Levie, A. Meat handbook. Westport, Conn.: AVI Publishing Company, 1979.

Libby, J. A. (Ed.) Meat hygiene. Philadelphia: Lea & Febiger, 1975.

McClay, D. R. Final report to U.S. Department of Health, Education, and Welfare on the national ag occupations competency study. State College, Penn.: Instructional Consulting and Research Associates, Inc., 1978.

Meat cutting. Missouri University, College of Education, Department of Industrial Education in cooperation with Industrial Education Section, State Department of Education, Columbia, Mo., 1958.

National Independent Meat Packers Association. Proceedings: 17th & 18th annual meat science institute. University of Georgia, College of agriculture, Department of Food Science and Center for Continuing Education, Athens, Georgia.

Nicholls, W. H. Labor productivity functions in meat packing. Chicago: University of Chicago Press, 1948.

Price, J. F. & Schweigert, B. S. (Ed.). The science of meat and meat products. American Meat Institute Foundation. San Francisco: W. H. Freeman & Co., 1971.

Romans, J. R. & Zeigler, P. T. The meat we eat. Danville, IL: Interstate Printers and Publishers, 1974.

Swift and Company. The meat packing industry in America. Chicago: Swift and Company, 1931.

Technical reference handbook. Vocational-Technical Education Consortium of States, Atlanta, Georgia, 1978.

Thorton, H. Textbook of meat inspection (4th ed.). London: Balliere, Tindall and Cox, 1962.

U.S. Department of Agriculture, Inspection Standards and Regulations Staff Technical Services. Animal and plant health inspection service (APHIS).

Warmbrod, J. R. & McCracken, J. D. Identifying and assessing technical competence of prospective teachers. The Journal of the American Association of Teacher Educators in Agriculture 17(3): 1-8, 1976.

Wilson, A. Practical meat inspection (2nd ed.). Oxford: Blackwell Scientific, 1975.

Yoder, E. P. & McCracken, J. D. Determination of a common core of basic skills for agribusiness and natural resources. Columbus, Ohio: The Ohio State University, 1975.

CHAPTER III

OTHER ACTIVITIES, RESULTS, AND RECOMMENDATIONS

Problems

There were no major deviations from planned activities.

Publicity and Dissemination Activities

The publication "Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries" was released to 550 Illinois high school and post-secondary agriculture teachers. Their requests for additional copies of this item will be handled by the Curriculum Publications Clearing House, 47 Horrabin Hall, Western Illinois University, Macomb, IL.

In mid October 1979 a statewide newspaper and radio release was made concerning the horticulture teacher workshops. This release was printed in "Country Column" in dozens of local Illinois newspapers.

Resource Persons

Advisory council members are listed in the section titled List of Consultants. Each provided technical advice within their professional disciplines. Input was gathered from 36 business site interviews, 14 teacher consultants and 11 advisory committee members. The breadth of experience provided by these resource persons was an important factor in the successful completion of the project.

Summation of Evaluation Data Collected

Each major project activity was evaluated by input from the appropriate advisory council members. In addition, specific technical evaluation was

provided by industry interviews. The results strongly support the need for this kind of evaluation.

Conclusions and Recommendations

The conclusions of the horticulture inservice activity suggest that teachers can prepare locally developed competency based instructional materials. It may be possible to transport locally developed materials to other programs. Also the use of a self-instruction guide for directing the development of competency based materials was found to be useful.

The results of the task analysis or purposive study of the meat processing and grain elevator industries include identification of entry level work tasks. These work tasks will serve as the basis for development of competency based instructional materials.

Horticulture inservice activity recommendations:

1. The teacher developed competency based materials should be field tested to determine if they can be used by other teachers.
2. The self-instruction guide should be used to prepare locally developed competency based vocational curriculum in other vocational disciplines.

Task analysis or purposive study recommendations:

1. Students should be made aware of career possibilities in the grain elevator and meat processing industries through the vocational program.
2. The study of meat processing and grain elevator operations should be taught in the vocational education curriculum. This recommendation is based on the knowledge that no program is in existence in this state which provides training in these fields.
3. The tasks to be included in the vocational curriculum may be categorized by following these guidelines:
    a. tasks labeled as essential or important can be taught in a high school setting.
    b. tasks labeled as useful can be taught in a junior college, university or vocational school setting.

c. tasks labeled unnecessary for a beginner can be taught on the job as the worker progresses or in an advanced program at a college or university.

Staff Employment and Utilization

All employees were staff of Southern Illinois University at Carbondale.

APPENDIX A

List of Meat Processing Tasks

77

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

KILL FLOOR

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Wear protective clothing			
	Observe safety precautions			
	Use proper equipment			
	Maintain equipment and work area			
	Weigh animal			
	Run animal into chute			
	Immobilize animal			
	Bleed animal			
	Hogs			
	Put hog in scalding vat and then in dehairer to dehair			
	Remove viscera, toenails & dewclaws			
	Hang carcass and remove remaining hair by shaving			
	Split, wash and tag carcass			
	Place in cooler			
	Cattle			
	Remove forefeet			
	Hang carcass			
	Open hide down midline and remove			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

KILL FLOOR (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Trim carcass			
	Open abdominal cavity			
	Remove paunch, intestines, liver, spleen & stomachs			
	Cut diaphragm and remove pluck			
	Remove head, tail and hind feet			
	Split, wash and tag carcass			
	Place in cooler			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

CUTTERS

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Maintain knives and utensils and good sanitation			
	Observe all safety precautions			
	Identify primal cuts			
	Refrigerate and store meats			
	Beef breaking/cut:			
	Ribs			
	Short loin			
	Sirloin			
	Chuck			
	Brisket			
	Plate			
	Flank			
	Round			
	Fore and hind shanks			
	Pull tenderloin			
	Trim cuts of beef			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

CUTTERS (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Pork breaking/cut:			
	Pork loin			
	Fresh hams			
	Bacon			
	Shoulder			
	Fat back			
	Jowl			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

BONERS

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Bone all meat for hamburger and sausage			
	Clean heads			
	Trim fat from meat			
	Cube meat for grinding			
	Grind meat coarsely			
	Maintain safety precautions			
	Maintain equipment			
	Clean work area			
	Use proper sanitation methods			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

WRAPPING & PACKAGING

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Slice bacon and hams			
	Grind hamburger			
	Patty hamburger or package for freezing			
	Wrap meats			
	Identify meat packages			
	Fill meat orders			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

SANITATION

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Clean:			
	Slicers			
	Saws			
	Knives			
	Pans			
	Grinders			
	Stuffers			
	Pattying machine			
	Tables			
	All utensils			
	Floors			
	Work area			
	Kill floor equipment			
	Sausage equipment			
	Fat rendering equipment			
	Smoke house			
	Racks, combs and rods			
	Coolers			
	Showcase			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

CURING CREWS

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Lard Rendering			
	Collect fat			
	Grind fat			
	Place in rendering kettle and set temperature			
	Remove, strain and place in containers (rendered fat)			
	Remove cracklings and clean kettle			
	Curing and Smoking Bacons and Hams			
	Trim bacon and hams			
	Bone, shape and trim internal fat from hams			
	Tie hams and stuff in casings or cryovac			
	Pump meat with cure or feed pump machine			
	Check meat for proper injection			
	Weigh ham			
	Set smokehouse schedule, hang hams, insert combs in bacon and put in smokehouse			
	Take internal temperature			
	Unload smokehouse			
	Separate grades of hams and bacons--remove stockinettes			
	Hang and place in coolers			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

CURING CREWS (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Clean machines, knives and tools			
	Clean work area			
	Sausage			
	Grind beef and pork			
	Place in cutter or chopper			
	Add salt, dextrose and seasoning			
	Add pork trim and remaining moisture and mix			
	Transfer to the stuffer			
	Stuff sausage casing			
	Set schedule in the smokehouse			
	Hang sausage and place in smokehouse			
	Shut down smokehouse and apply steam			
	Shut off steam and apply cold water shower			
	Hang sausage to dry			
	Place sausage in cooler			
	Clean grinder, chopper, stuffer, work area and tools			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

SALES

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Wholesale and Retail			
	Take meat orders			
	Supervise filling of meat orders			
	Package and freeze meat orders			
	Identify packaged meats			
	Identify customer's filled order			
	Notify customer of finished order			
	File order			
	Keep in touch with customers regularly			
	Order extra meat needed			
	Supervise livestock buying			
	Arrange transport of livestock			
	Arrange meat in showcase and keep it stocked			
	Slice bacon, lunchmeat and ham			
	Slice loins, butts, roasts and ribs			
	Crack ribs			
	Clean: saws, slicers, scales, blocks and showcase			
	Keep retail area neat and clean			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

SALES (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Know meat prices			
	Be cordial to customers			
	Work cash register			
	Take and fill meat orders			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MANAGEMENT/BOOKKEEPING

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Employee payroll			
	Employee relations			
	Tax work			
	Keep debit/credit books			
	Banking arrangements			
	Laundry service arrangements			
	Order supplies			
	Maintain sanitation levels			
	Order meats			
	Supervise livestock buying and transportation			
	Schedule processing and meat orders			
	Maintain customer file and correspondence			
	Rendering service arrangements for waste products			
	Supervise various areas and workers			
	Order spices, casings and various containers			

APPENDIX B

List of Grain Elevator Tasks

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

PRODUCTION

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Compute weight loss incurred in drying grain			
	Analyze seed samples			
	Properly label seed samples			
	Identify types of grain damage (B.C.F.M.)			
	Identify materials that may contribute to odor contamination of grain			
	Identify sources of grain contamination			
	Observe concentration of insects in grain			
	Identify insect damage			
	Identify seed-borne disease			
	Identify weeds commonly found in crops grown locally			
	Identify weed seeds commonly found in crops grown locally			
	Weigh grain as it arrives at the elevator			
	Weigh trucks as they leave the elevator			
	Operate seed treating equipment			
	Operate seed cleaning equipment			
	Use balances, moisture testers, screens, and dockage machines used in grading grain			
	Operate devices for detecting "hot spots" in stored grain			
	Draw a representative sample of grain from a truck or car			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

PRODUCTION (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Price grain based on grade, weight, and quality			
	Grade grain according to USDA Grain Standards Act			
	Blend various qualities of grain to meet grade			
	Load grain into cars or trucks for shipment			
	Control rodents			
	Clean grain bins			
	Drive big trucks (class C operators license preferred)			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner .

OFFICE

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Take orders for sales or service by telephone			
	Answer customer inquiries by telephone			
	Verify customer addresses using directories			
	Keep records of receipts and expenses			
	Make out and mail bills to collect accounts due			
	Arrange credit terms			
	Perform filing tasks			
	Check credit references of customers			
	Perform typing and mailing tasks			
	Keep employee work records			
	Prepare employee payroll			
	Pay accounts payable			
	Prepare for annual records audit			
	Prepare required government reports			
	Keep annual depreciation schedule			
	Keep customer credit records			
	Use adding machine and/or other tabulating devices in balancing accounts			
	Keep current inventory of grain stocks for sale and grain stocks stored for customers			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

OFFICE (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Check received grains against invoice listings			
	Check invoices for math errors			
	Prepare monthly financial statements			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

SALES

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Quote grain prices to farmers			
	Close a sale			
	Prepare scale tickets			
	Write up sales tickets			
	Prepare bills of lading			
	Prepare purchase orders			
	Quote grain prices to buyers			
	Calculate current storage costs			
	Quote current dockage rates to clientele			
	Follow up grain purchases and sales to determine customer satisfaction			
	Identify customer needs and wants			
	Prepare advertising materials			
	Use various types of advertising such as mail, radio, and newspaper			
	Solicit sales by telephone			
	Solicit purchases by telephone			
	Resolve customer complaints to meet company policy			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

SAFETY

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Operate fire extinguishing equipment			
	Obtain and comply with O.S.H.A. requirements for such things as grain dust control, power shields, ladders, lighting, etc.			
	Obtain and comply with E.P.A. regulations for grain dust control			
	Memorize fire department's phone number			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MANAGEMENT

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Obtain reasons for dockage and be familiar with grain industry standards			
	Obtain market prices			
	Explain to customers how market prices are established			
	Obtain information on how market prices are set daily and hourly			
	Obtain the definitions of common grain marketing terminology; e.g., basis, hedging, margin, futures, etc.			
	Establish current marketing plans and account systems; e.g., forward pricing, storage, delayed pricing, etc.			
	Effectively communicate with all clientele; e.g., farmers, truckers, grain dealers, etc.			
	Explain to clientele the transportation relationships between markets; e.g., country elevators, terminal markets, etc.			
	Explain to clientele reasons for price difference between board of trade and local elevator			
	Obtain reasons for grain damage and how to prevent it; e.g., auger damage, drop damage, use of drags to prevent damage, etc.			
	Obtain reasons for blending grains			
	Arrange for transportation and distribution of grains purchased			
	File federal, state, and local taxes			
	Comply and keep up to date with all business regulations			
	Administer social security and other employee benefit programs			
	Identify labor needs			
	Recruit employees			
	Interview and select employees			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MANAGEMENT (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Designate employee work assignments			
	Supervise employees			
	Train new employees			
	Evaluate employee performance			
	Maintain position reports as required by the U.S. Dept. of Agri.			
	Review on a periodic basis all corporate documents, by-laws, articles, etc.			
	Perform personnel actions such as promoting or firing			
	Establish employee wages, hours, and working conditions			
	Determine business credit needs			
	Locate sources of and secure credit			
	Determine need for and purchase insurance for business			
	Select and purchase equipment and expendables not for sale			
	Allocate monies in preparing working budget			
	Analyze the business enterprise on cost and return basis			
	Participate in grain and feed organizations			
	Plan business advertising			
	Negotiate sales and buying contracts			
	Negotiate storage and handling contracts			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MANAGEMENT (3)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Prepare and implement contracts			
	Write annual report to board of directors			
	Organize meetings for board of directors			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MAINTENANCE

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Keep work, storage, and delivery areas neat and clean			
	Perform light maintenance of business vehicles; e.g., oil level tire pressure, battery & radiator water levels, other fluid levels, etc.			
	Perform minor tune-up of business vehicles by replacement of spark plugs and ignition points			
	Change oil and grease business vehicles			
	Perform minor carpentry repairs; e.g., doors, siding, fences, etc.			
	Repair electrical light switches and extension cords			
	Paint buildings and equipment when needed			
	Clean and oil electric motors			
	Grease all bearings periodically on equipment			
	Order repair parts for all equipment			
	Maintain and repair small gasoline engines			
	Repair and/or replace V-belts and drive chains			
	Replace electrical fuses			
	Keep all tools clean and properly stored			
	Clean grounds of leaves and litter			
	Spray chemicals to control weeds and insects around grounds			
	Mow and trim lawns			

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

MAINTENANCE (2)

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
	Shovel snow			
	Operate snow removal equipment			
	Repair driveways			
	Grade driveways			
	Fill to proper level all gear boxes with gear oil			

APPENDIX C

Advisory Committee Materials

1. Field test letter to advisory committee - grain elevators
2. Agenda for first advisory committee meeting - grain elevators
3. Introductory letter to places to be interviewed - grain elevators
4. Information letter to advisory committee - meat processors
5. Agenda for first advisory committee meeting - meat processors
6. Field test letter to advisory committee - meat processors
7. Introductory letter to places to be interviewed - meat processors
8. General letter requesting information - meat processors

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

1.

October 25, 1979

Herb Sutter, General Manager
Randolph Service Company
Route 4
Sparta, Illinois 62286

Dear Mr. Sutter:

Enclosed you will find a list of tasks that have been developed concerning entry level employees for grain elevators. Thank you for your contributions to the list. I would appreciate it if you could look over the list and make any additions or deletions you deem necessary. If possible, could you circulate this list among your colleagues to get their input?

Upon completion of the revised list, I will send you a copy and keep you up to date on all developments.

Sincerely,

Joseph V. Ambrosia
Graduate Assistant

JVA/hcd

AGENDA

2. GRAIN ELEVATOR CURRICULUM PROJECT

Wednesday, January 16 1:00 p.m. Iroquois Room

SOUTHERN ILLINOIS UNIVERSITY

I. INTRODUCTION TO THE PROJECT — JIM LEGACY
- Overall project
- Phase one objects
- Role of the Advisory Committee
- Introduction to task analysis

II. EXPLANATION OF THE TASK ANALYSIS — JOE AMBROSIA
- Creation of the preliminary task list
- Establishment of terminology
- Organization of task groups
- Addition of tasks and task groups by the committee
- Field test results

III. EXPLANATION OF GRAIN ELEVATOR INTERVIEWS — JOE AMBROSIA
- Development of the task list and interview form
- Selection of interview sites
- Reaction of interview sites by the committee

IV. SUMMARY — JIM LEGACY
- Results of today's meeting
- Purpose of the next meeting
- Schedule time for next meeting
- Complete SIU forms for expenses

SIU

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

3.

January 25, 1980

Thank you for consenting to be part of our Grain Elevator Curriculum Board.

Our schedule has been completed and the date and time that you can expect us will be _____ at _____. If this time and date is not convenient for you, please let us know by contacting either myself or Dr. Legacy by phoning 800-642-5337, ext. 258.

If we don't hear from you, I will assume this date is convenient and will be at your establishment as scheduled.

I am looking forward to meeting with you then.

Sincerely,

Joe Ambrosia
Research Assistant

JA/hcd

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

4.

November 8, 1979

Thank you for consenting to be part of the Advisory Council for our Meat Processing Curriculum Project. This project is part of a plan to develop competency-based teaching materials for two agricultural occupations.

Our first meeting has been scheduled for November 14, 1979, Wednesday, from 9:00 am to 11:00 am in the Student Center, second floor Illinois River Room, here on campus.

I have enclosed a copy of the agenda that we will be following at our meeting.

We are looking forward to seeing you then. If you have any questions, feel free to call me at 536-7733.

Sincerely,

Denise Vahlkamp
Research Assistant

AGENDA

MEAT PROCESSING CURRICULUM PROJECT

5. Wednesday November 14 9:00 a.m. Illinois Room

SOUTHERN ILLINOIS UNIVERSITY

I. INTRODUCTION TO THE PROJECT JIM LEGACY

- Overall Project
- Phase One Objects
- Role of the Advisory Committee
- Introduction to Job Title Analysis

II. Explanation of the Job Title Analysis DENISE VAHLKAMP

- Creation of the preliminary job title list
- Organization of job title clusters and business groups
- Addition of job titles, clusters and business groups by the committee
- Telephone interview format and field test results
- Selection of telephone interviews

III. Explanation of the Meat Processors Interviews DENISE VAHLKAMP

- Development of the task list and interview form
- Selection of interview sites

IV. SUMMARY JIM LEGACY

- Results of todays meeting
- Purpose of the next meeting
- Schedule time for next meeting
- Complete SIU forms for expenses

SIU

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

6.

December 11, 1979

Since our Advisory Committee meeting, I have revised our task list, and I would like to have you look over this new edition at this time and make any corrections, additions or subtractions that you feel are necessary.

Our program is proceeding in an orderly manner, and we are presently preparing to make the preliminary appointments with the chosen meat markets and secondary processors (grocery stores). If you have any suggestions for grocery stores or other secondary processors that you feel we should include in our interviews, please let us know soon. We have three secondary processors from region three, but still need them for other regions.

We are hoping to hear from you soon concerning these matters, and would like to extend to you our best wishes for a Happy Holiday Season and a bright New Year.

Thank you for your cooperation and all your help.

Sincerely,

Denise Vahlkamp
Graduate, Research Assistant

SIU

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

7.

January 25, 1980

Thank you for consenting to be part of our Meat Processing Curriculum Board.

Our schedule has been completed and the date and time that you can expect us will be _____ at _____. If this time and date is not convenient for you, please let us know by contacting either myself or Dr. Legacy by phoning 800-642-5337, ext. 258.

If we don't hear from you, I will assume this date is convenient and will be at your establishment as scheduled.

I am looking forward to meeting with you then.

Sincerely,

Denise Vahlkamp
Research Assistant

DV/hcd

SIU

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

8.

We are in the process of defining and describing what meat processors do in their jobs. We are doing this so that in the educational process, we can be more specific about the skills that the beginning learner should develop in occupational programs related to meat processing. In order to get this done, we need to gather information from many sources which help define what persons in the meat processing industry do. If you have any of this type of information, would you be willing to help us by sending copies of this information?

We have also drawn up a list of what processors must do and would like to enlist your help by asking you to review and return it with any comments you may wish to make.

We are looking forward to hearing from you on this subject. Thank you for your time and consideration.

Sincerely,

Denise Vahlkamp
Research Assistant

DV/vf

Att.

APPENDIX D

Publicity and Dissemination Materials

1. Letter to Illinois High School Agriculture Instructors
2. Copy of news release

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Agricultural Education and Mechanization
Telephone 618-536-7733

****
* PLEASE REVIEW THE ENCLOSED MATERIALS *
****

TO: Illinois High School Agriculture Instructors

FROM: James W. Legacy, Agricultural Education
Southern Illinois University/Carbondale

RE: "Agricultural Job Opportunities in Illinois
Meat Processing and Grain Handling Industries"

As you know, in Illinois agribusiness is a large and growing industry. In addition to providing employment for a large number of people, agriculture is a diverse and rapidly changing field.

To promote student interest in agriculture, Southern Illinois University and the Illinois State Board of Education have developed a descriptive bulletin designed for use with individual students in career planning sessions or for use in the classroom as a guide to the major business areas of Illinois agriculture. The bulletin contains a partial list of job competencies that a beginning employee in today's meat processing or grain elevator industry should possess.

Additional copies of the enclosed "Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries" have been printed and are available upon request. Copies are available on a cost recovery basis by using the attached order form or by contacting:

F. Gene Miller, Director
Curriculum Publisher's Clearing House
47 Horrabin Hall
Western Illinois University
Macomb, IL 61455
Telephone: 1-800-322-3905

If you are interested in helping to develop the teaching materials for grain elevator and meat processing industry beginning workers, contact me at the following address. Your input is an important part of the final product.

James W. Legacy
Agricultural Education & Mechanization
School of Agriculture
Southern Illinois University
Carbondale, IL 62901
Telephone: 1-800-642-5337

"Agricultural Job Opportunities in Illinois Meat Processing and Grain Handling Industries"

Please send me _____ copies of the above booklet to the following address:

Teacher_____

School_____

Address_____

City/State/Zip_____

112

Yes, I am interested in helping design and develop teaching materials for grain elevator and meat processing beginning workers. Please send me more information.

Teacher_____

School_____

Address_____

City/State/Zip_____

NEWS FROM SIU
University News Service
Pete Brown, Director 618/453-2276
Southern Illinois University at Carbondale
Carbondale, Illinois 62901

10 - 25 - 79

SIUC COUNTRY COLUMN
by Gordon Billingsley

Agriculture teachers help
write own textbooks

A unique program that will let Illinois high school vocational teachers take a hand in writing their own textbooks has been well received among teachers in the state.

"It is surprising the large percentage of teachers who are willing to participate in writing their own teaching materials for vocational classes," says James Legacy, an assistant professor of agricultural education at the Southern Illinois University-Carbondale School of Agriculture. He is project leader for the new program that is sponsored in part by the Illinois State Board of Education.

Legacy said more than three-forths of the teachers he's sought out have helped in the pilot program, which eventually will be taken to all 450 agriculture high school teachers in Illinois.

He said the program serves the additional purpose of helping the cooperating teachers to update their information and skills on vocational topics.

"The problem we've run into recently is that vocational teachers' skills can become outdated," Legacy said. "The half-life of a teacher's technical knowledge in a vocational subject area is usually about seven years.

"This technical knowledge needs updating, and we are hoping that this method gives teachers an added incentive to seek that updating. Unlike English teachers who can consult a textbook, vocational teachers usually write their own class materials.

"The way we help in this case is the focus of the program. About 15 teachers are hired as consultants. They go out into the industry for which the vocational

program is designed to train employees, and they find out what skills are needed in new employees. Changes in these needs is how a teacher's skills can become outdated.

"The information that these consultants bring back is given to the participating teachers, each of whom will write part of the new text."

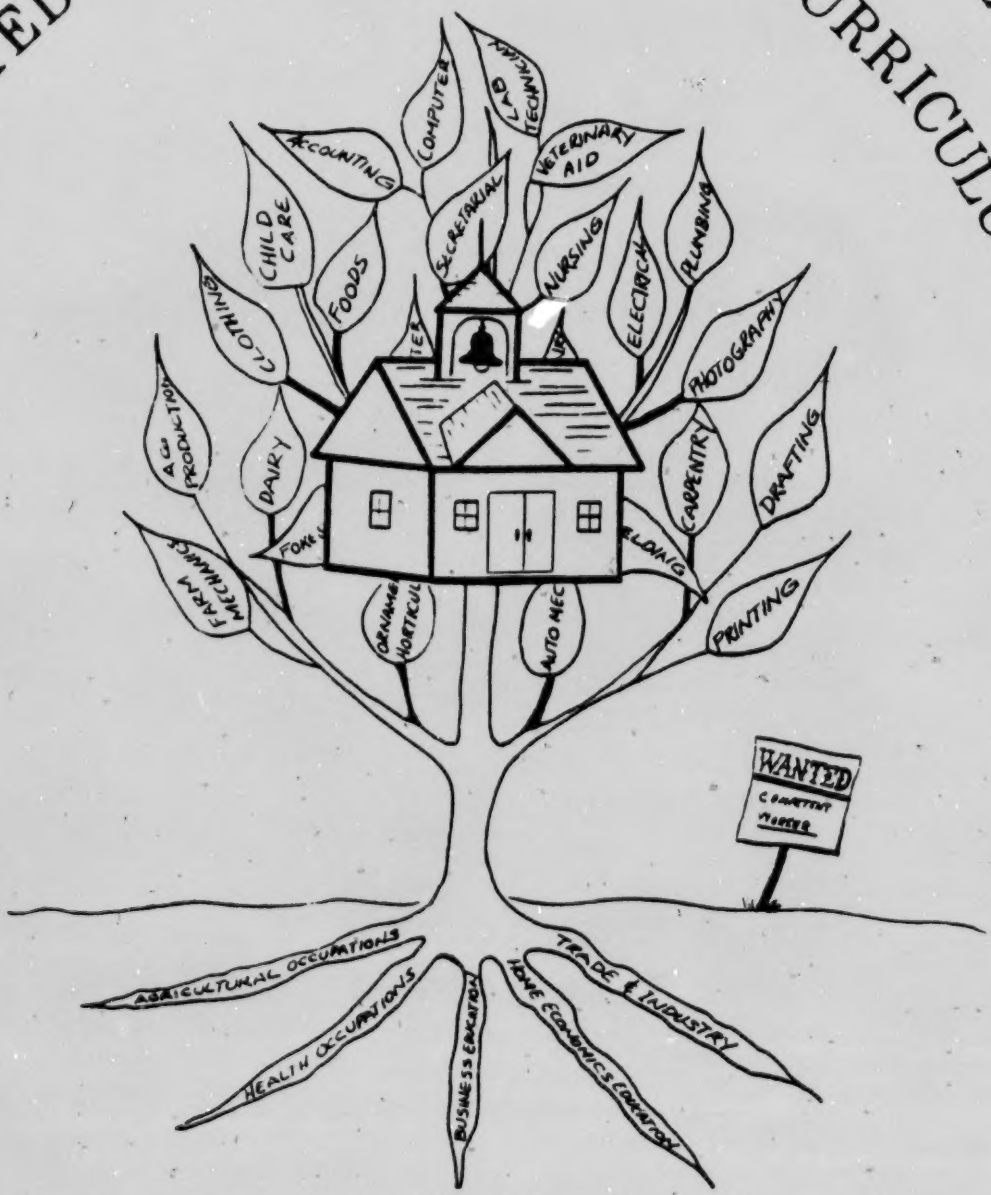
The pilot program has 60 horticulture teachers enrolled. When the program is enlarged to encompass the rest of the state, subject areas will include agricultural production, farm supplies and service, agricultural mechanization, agricultural products, agricultural resources and forestry.

-gb-

APPENDIX E

Working Copy of
"Self-Instruction Guide for Developing Locally Directed
Competency Based Curriculum"

SELF-INSTRUCTION GUIDE FOR DEVELOPING LOCALLY DIRECTED COMPETENCY BASED CURRICULUM



This material was prepared by: Jim Legacy, Gerald Coorts, Thomas Stitt, William Symons, Fred Reneau, Terry Savko, Amy Swigart, Carole Daesch, Sammye Fark, Sheryl Gueldenhaar, Bob Koehn, 42 Illinois vocational teachers in cooperation with the Illinois State Board of Education, Department of Adult, Vocational and Technical Education personnel, Peggy Pool and Alan Utech, and the Department of Agricultural Education and Mechanization of Southern Illinois University at Carbondale.

Contents

PREFACE

1. DEVELOP A TASK LIST 1

   What is a Task List and How is It Used?
   How to Prepare a Task List
   Chapter One Review

2. INTERVIEW WITH INDUSTRY 5

   Introduction
   Summarizing the Employer Interview
   Sample Interview Format
   Chapter Two Review

3. GROUPING TASKS INTO TEACHING UNITS 10

   Introduction
   Three Reasons for Grouping Tasks into Units
   Sample List of Teaching Units with Tasks
   Chapter Three Review

4. WRITING KNOWLEDGE AND SKILL COMPETENCY STATEMENTS 15

   Introduction
   Writing Skill Statements
   Writing Knowledge Statements
   Chapter Four Review

5. PREPARING TEACHING MATERIALS 41

   Writing Questions and Answers
   Writing Skill Steps and Key Points
   Chapter Five Review

6. EVALUATE AND RECORD STUDENT ACHIEVEMENT 47

   Introduction
   On-the-job Evaluation Form
   Classroom Test
   Skill Test Check List
   Chapter Six Review

Preface

This booklet has been designed as a guide for the development of locally directed industry-based vocational education programs. Teachers should not be expected to follow each activity nor be held only to the activities and outcomes suggested within this text. The most encouraging feature of the system described here is that it has been tried and redesigned with the experiences of 42 Illinois vocational teachers.

The job of teachers reading and following the guidelines of this booklet will be to develop a vocational program which is based on the needs of industry. Each chapter has been summarized with a set of questions and answers which feature the important concepts of chapters. The opportunity of theprocess described here may range from designing new programs to determining that an existing program was already industry oriented. Both outcomes contribute to strengthening Illinois vocational programs.

Chapter 1

Develop A Task List

What is a Task List and How is it Used?

The development of a competency based curriculum can be beneficial to both the instructor and the student. The course material selected for instruction is based upon industry's training needs for entry-level and advanced workers. After designing a curriculum which fulfills this requirement, it is easy to explain to students and others why subject matter topics are presented in the classroom. The task list is a collection of work activities. Once written, this list becomes the basis for teaching students to perform work details which are most needed by beginning workers.

In order to construct a competency based curriculum, it is necessary to talk with and interview employers. Employers should be asked what work activities (tasks) are performed by beginning and advanced workers. The employer task check emphasizes the work activities (tasks) which must be taught in order to prepare students for entry employment in industry. Thus, course content is directed by industry's needs as well as what the teacher may think a beginning or advanced worker should know to attain employment.

Task identification is the first step in designing a competency based curriculum. Tasks are items which describe activities you think are performed by workers.

Step Two is to determine which tasks are most important to entry or beginning workers. Step two involves verification of beginning tasks by interviewing industry employers.

Step Three - Once the important tasks are identified, the teacher determines the learning activities which will prepare students to perform the beginning work tasks. Learning activities are developed by identifying knowledge and skills which a worker needs to know or know how to do in order to perform each task. Knowledge statements provide the information necessary for the student to complete the task successfully. The skill statements list the proper steps involved in the performance of the task.

The readings and activities of this guide have been designed to assist vocational teachers in the development of locally directed competency based programs. The steps suggested have been tried by a group of 42 Illinois vocational teachers at both the secondary and post-secondary level. Many of the suggested activities are taken from their experiences.

How to Prepare a Task List

When designing a task list it may be helpful to develop a list of potential job titles your program's students will be able to assume upon completion of a training program. This job list helps the teacher identify the names of businesses which are likely to be employers of a vocational program's students.

****
EXAMPLE
****

Listed are a group of job titles in the horticulture field. Following each job title is the name of the business area which the job title is most often associated with. Identification of business areas for your vocational program is the first step in preparing a task list.

JOB TITLES	BUSINESS AREA
Flower grower	Greenhouse Production
Turf consultant	Turf/Lawn Service
Landscape gardener	Landscape/Nursery
Cut flower designer	Floriculture

*****

Once each type of business is identified, a list of work activities which will be called TASKS can be made. Tasks are short phrases which describe what the business employees are expected to do. Be sure to consider all possible work activities which might be performed in the business. Task lists usually contain about 100 items and can be grouped into major work categories. Remember that this list of tasks is to be taken to industry representatives for their additions and corrections. Our experience has shown that the task list is more meaningful if it is broken into several major work categories. The five most used work categories are: 1) Production, 2) Sales, 3) Office (clerical), 4) Maintenance, and 5) Management.

Below is a sample of tasks for each work category of the Retail Florist business. The total task list for the Retail Florist business numbered 97.

PRODUCTION

Make bows
Design floral arrangement
Wrap products sold

SALES

Use telephone to accept and send customer orders
Sell floral products
Operate cash register

MAINTENANCE

Clean cooler
Keep work and delivery area neat
Maintain tools and equipment

MANAGEMENT

Order plant materials
Plan business advertising
Designate employee work assignments

CHAPTER ONE REVIEW

1. Consider that a vocational horticulture teacher has indicated the following as a list of potential jobs for program graduates. Match the potential job with the proper business area.

POTENTIAL JOBS	BUSINESS AREA
____ Plant propagator	A. Horticulture Sales
____ Greens keeper	B. Floriculture
____ Floral designer	C. Turf & Lawn Services
____ Gardener	D. Landscape and Nursery
____ Plant breeder	E. Horticulture Research
	F. Greenhouse Production

ANSWERS FOUND ON PAGE 4

2. Listed below are ten tasks. Place the number of the current work category to the left of the specified task.

TASKS	WORK CATEGORY
____ Plant seed	A. Production
____ Pay accounts payable	
____ Negotiate purchasing and sales contracts	B. Sales
____ Order repair parts for equipment	C. Office (clerical)
____ Lable merchandise	
____ Keep production records	D. Maintenance
____ Propagate plants by cuttings	
____ Use proper storage techniques	E. Management
____ Take inventory	
____ Identify labor needs	

ANSWERS FOUND ON PAGE 4

ANSWERS TO CHAPTER ONE REVIEW

1. B, C; A; D; E.

2. A; C, E; D, B, C; A; D; B, E.

Chapter 2

Interview With Industry

Introduction

As a teacher preparing or teaching competency based courses, you will need to contact workers or work sites to validate the selection of teaching content. In order to conduct interviews systematically, a list of businesses in your geographic area is helpful. In addition to the businesses that you are acquainted with, we suggest including businesses that may be suggested by an advisory committee or listed in the yellow pages of a telephone directory.

After you have completed a list of businesses, tentatively select at least three businesses that you wish to interview. Of these three businesses, select one large, one average size, and one small business in order to get a cross-sectioning of the businesses in your geographic area. Businesses that you select should meet the following criteria:

1. The business is engaged primarily in the broad area your course prepares for employment; it receives 50 percent or more of gross income or financial support from the sale of products or services in this area.

2. The business employs workers in the specialties you are preparing persons for employment in.

3. The business uses up-to-date and representative business practices and equipment.

4. A business representative is cooperative and receptive to an interview.

You may wish to bring the list of businesses and the names of the three businesses that you plan to interview to an advisory board meeting or to school officials for their concurrence with your plans.

Summarizing the Employer Interview

In order to develop curriculum which will be based on tasks that are more frequently performed by entry-level employees, the tasks have to be ranked by importance. The task statements for production, sales, delivery and maintenance, clerical, and management are ranked by the following classification:

Essential Tasks
Important Tasks
Useful Tasks
Tasks which a beginner doesn't need to know

Sample Interview Format

College of Agriculture
Department of Agricultural Education and Mechanization
Southern Illinois University
Carbondale, Illinois 62901

Name of Business _____

2. Address _____
(Street) (City) (Zip)

(Telephone) (Person Contacted)

3. Number of Employees

	Full-time	Part-time	Seasonal
1. Production			
2. Sales			
3. Bookkeeping			
4. Maintenance			
5. Management			

4. Number of New Employees Hired (Vacated and/or new employees)

1. Production	
2. Sales	
3. Bookkeeping	
4. Maintenance	
5. Management	
6. Other titles	

OPTIONAL

5. Range of Income of Employees

1. Production	
2. Sales	
3. Bookkeeping	
4. Maintenance	
5. Management	

KEY

D-Daily
W-Weekly
M-Monthly
Y-Yearly
O-Other

B-Performed by beginning employees
A-Performed by advanced employees
M-Performed by manager
O-Performed by owner
M/O-Manager/owner

LANDSCAPE/NURSERY

Production

		Time D-W-M-Y-O	Importance B-A-M-O	Other Comments (Who performs the task)
11001	Plan nursery production schedule			
11002	Take soil samples			
11003	Test soil samples			
11004	Fertilize plants			
11005	Determine soil mix for specific plant requirements			
11006	Mix and pasteurize media			
11007	Plant seed			
11008	Transplant seedlings			
11009	Select stock plants			
11010	Propagate plants by cuttings			
11011	Thin and space nursery stock			
11012	Label planted rows or areas			
11013	Plant cover crops			
11014	Lay plastic			
11015	Identify plant material			
11016	Identify common insects			
11017	Control insects using approved methods			

The essential and important tasks serve as a basis for required learning activities in a competency based curriculum. The useful tasks are covered briefly and can be included as optional learning activities in the curriculum. Tasks which a beginner doesn't need to know will not be included in the curriculum.

The criteria for ranking tasks as essential, important, useful, or tasks that a beginner does not need to know is listed below. Sample tasks from the designer section of the Retail Florist curriculum are provided for each ranking.

Essential Tasks

Tasks were classified as essential if the majority of the businesses interviewed indicated the task was performed by a beginning employee.

Essential Tasks

Identify common flowers and foliage
Follow safety precautions
Design bud vase
Design simple corsage

Important Tasks

Tasks must be performed by a beginning and/or advanced employee in a majority of the businesses interviewed in order to be classified as important.

Important Tasks

Design hospital vase
Construct planters and terrariums
Give advice on care of cut flowers and foliage
Select proper design for occasion

Useful Tasks

Tasks were classified as useful if they were performed by beginning and/or advanced employees in any of the businesses interviewed.

Useful Tasks

Design fruit basket arrangement
Design wedding bouquet
Set up weddings

Tasks which beginners do not need to know

Tasks which were not performed by beginning and/or advanced employees in any of the businesses interviewed were classified as tasks which beginners do not need to know.

Tasks which a beginner doesn't need to know

Design casket spray
Plan and organize work activities

CHAPTER TWO REVIEW

1. What format is useful for gathering competency based curriculum data by industry interviews?

2. What questions should be asked on a preliminary information sheet of an interview guide?

3. What questions should be asked about each task during the interview?

4. Where can teachers obtain tasks lists to use as a basis for competency based interviews?

5. Which criteria should be used to select business or industry interview sites?

ANSWERS FOUND ON PAGE 9

CHAPTER TWO REVIEW ANSWERS

1. A chart format (see page 6) allows the opportunity to quickly indicate who performs the task and how often the task is performed.

2. a. Business address
   b. Name of person interviewed
   c. Number of employees
   d. Number of new employees
   e. Salary range of employees

3. a. Who performs the task?
   b. How often is each task performed?
   c. Ask for other comments, if any.

4. a. Universities' vocational teacher education staff members
   b. Illinois State Board of Education/DAVTE officials
   c. National Center, Ohio State University, Columbus, Ohio
   d. Local library loan from Curriculum Materials Center in Springfield, Illinois

5. a. Business is primarily involved in work related to your vocational program
   b. Business employs workers in specialties which your students could work
   c. Business uses modern practices and equipment
   d. Business is receptive to an interview

Chapter 3

Grouping Tasks Into Teaching Units

Introduction

After tasks that are to be included in the curriculum have been identified, grouping of tasks into teaching units must be completed. Grouping tasks into teaching units establishes the basis for developing unit learning activities. Tasks can be grouped into units for the following reasons:

1. The prerequisite nature of the tasks requires a certain sequence of learning
2. Use of common materials when performing the tasks
3. Relationship of tasks in an actual work setting or in industry (work setting order)

Three Reasons for Grouping Tasks into Units

1. The prerequisite nature of the task:

Tasks can be grouped into the same unit because of the prerequisite nature of the task. For instance, the task "Make bows" is taught in the same unit as "Design bud vase" in the Retail Florist curriculum. The reason for this sequence is the prerequisite nature of the task, "Make bows." Most bud vases contain bows, therefore making bows is a task a student needs to master before designing a bud vase. Hence, the task "Make bows" is taught in the same unit as "Design a bud vase.'

2. Use of common materials when performing the tasks:

Tasks can also be grouped into the same unit because common materials are needed to perform the tasks. By grouping tasks that use the same materials, it is hoped that preparation time and cost of materials will be reduced. The task "Receive, handle, and care for cut flowers received from the wholesaler" is included in the same Retail Florist unit as "Identify common flowers and foliage." In this situation, the availability of common materials makes it beneficial to use cut flowers in teaching these two tasks in the same unit.

3. Work order setting:

Another reason for grouping tasks into units is the relationship of tasks in an actual work setting. For example, the task "Write cards" is taught in the same unit as "Wrap products sold" in the Retail Florist curriculum. Often in a retail florist business a card for an order is written immediately prior to wrapping flowers for delivery. Since these two tasks are performed together in industry, they are taught in the same Retail Florist unit.

Sample List of Teaching Units with Tasks

Sixteen Retail Florists identified important tasks for their workers. Listed below are the tasks and the teaching units. The total listing of Retail Florist teaching units and tasks are shown here to give you an idea of the industry basis needed for a competency based program.

1. Identification of flowers and foliages (*Common Materials Example)

   Identify common flowers and foliages*
   Identify flowers
   Give advice on care of cut flowers and foliage
   Give information on care of plants and cut flowers
   Receive, handle, and care for cut flowers received from the wholesaler*

2. Maintenance and delivery

   Clean cooler
   Maintain tools and equipment
   Follow safety precautions
   Give advice on care of cut flowers
   Wrap products sold
   Deliver orders
   Keep work and delivery area neat and clean
   Light maintenance of delivery vehicle and building

3. Designing bud vase and wrapping floral product (*Prerequisite Example)

   Design bud vase*
   Write cards and lettering
   Make bows*
   Wrap products sold

4. Plant identification, care and selling preparation (Work Setting Order Example)

   Identify foliage plants and flowering plants
   Give information on care of plants and cut flowers
   Identify plant insect and disease infestations
   Construct planters and terrariums
   Dress potted plants
   Make bows
   Wrap product sold
   Write cards and lettering

5. Selling floral product

   Operate cash register
   Sell floral product
   Use telephone to accept and send customer orders

Use credit systems of payment
Explain and demonstrate accessory items
Identify customers' needs and wants
Give cost estimates of flowers and plants
Give information

6. Designing corsage

Design simple corsage
Design advance corsage

7. Designing basic types of arrangements

Select proper design for occasion
Select proper vase for design
Select proper flowers for vase, design, and occasion
Design centerpiece
Design advance style arrangements such as hospital and grand opening

8. Sympathy arrangements

Make bows
Write cards and lettering
Select proper design for occasion
Select proper vase for design
Design funeral basket
Select proper flowers for vase, designs, and occasions
Give estimates on funerals and weddings

9. Designing advanced style arrangement

Design dried, silk, and other permanent arrangements
Identify dried materials
Select proper design for occasion
Select proper vase for design
Select proper flowers for vase, design, and occasion
Design fruit basket arrangement

10. Displaying merchandise

Stock shelves
Establish and maintain display area
Set up display area
Check invoices of received merchandise

11. Wedding

Select proper design for occasion
Select wedding bouquet
Set up wedding
Give cost estimates on funerals and weddings

CHAPTER THREE REVIEW

1. What are the three criteria used to group tasks into units of instruction?

2. Why are tasks grouped into units?

ANSWERS FOUND ON PAGE 14

CHAPTER THREE REVIEW ANSWERS

1. a. Prerequisite
   b. Use of common teaching materials
   c. Work order setting

2. Grouping into units establishes the basis for developing learning activities. The task groups are lists which can be understood by both industry and education officials.

Chapter 4[123]

Writing Knowledge and Skill Competency Statements

Introduction

The next step in writing your own competency based curriculum is writing knowledge and skill statements for each task. Knowledge and skill statements convey exact knowledge items and skills to the student. Knowledge statements are defined as the intellectual or cognitive elements needed to complete the tasks successfully. Skill statements are defined as the performance or psychomotor elements needed to complete the tasks successfully. The knowledge and skill statements for the sample task statement, "Design a simple corsage" are listed below. Note that the skill statements are listed in sequence as the task should be performed.

Sample Task Breakdown

Task:	Design a simple corsage
Knowledge 1	What plant materials are best adapted for the pierce, clutch, hook or hairpin method of wiring flower stems?
Skill 1	Wire flowers using pierce, clutch and hook methods.
Knowledge 2	What colors are Floratape available in?
Skill 2	Floratape wired flower and foliage stems.
Knowledge 3	How should flowers, foliage, and bows be placed in a corsage?
Skill 3	Place flowers and foliage in a corsage.
Knowledge 4	What are uses of feathered carnations?
Skill 4	Feather a carnation.

Knowledge and skill statements can be used in several ways. Some suggested uses of knowledge and skill statements are:

1. Provide teacher with course objectives.
2. Provide students with a list of the skills and the knowledge they need to have.
3. Serve as a check-off list for student evaluation. The task is checked when the student has perfected it.

4. Provide an effective communication link between industry and school.

5. Provide employers with a list of student's capabilities and achievements.

6. Furnish the means for curriculum evaluation by the vocational program advisory committee.

The following exercises are designed to acquaint you with the process of writing knowledge and skill statements. This material is written in self-instruction style.

SELF-INSTRUCTION DIRECTIONS:

You may complete this exercise by reading each example carefully and answering the questions which follow each example. Check the correct answer by turning to the page following each question.

Writing Skill Statements

1. SKILL STATEMENTS MUST BE WRITTEN FOR EACH TASK. Skill statements are the psychomotor (performance) elements that are needed to complete the task successfully. Every task has at least one definite step that has to be completed in order to perform the task. For example, in order to design a simple corsage a student must wire flowers. "Wire flowers" is a definite step in the task, "Design simple corsage." Therefore, "Wire flowers" is listed as a skill statement for the task, "Design simple corsage." See example 1.

****
EXAMPLE 1
****

Task	Design simple corsage
Skill	Wire flowers

Question 1.

Read the following statement and answer the question below it.

Task	Use telephone to accept and send customer orders
Skill	Take order by phone

Is "Take order by phone" a definite step that has to be completed to perform the task, "Use telephone to accept and send customer orders"?

Yes (turn to the next page)
No (turn to back of this page)

ANSWER TO QUESTION 1

You said, no the skill statement, "Take order by phone," was not a definite step that had to be completed in order to perform the task, "Use telephone to accept and send customer orders."

Yet, taking the order by phone is the first step for this task. Since "Take order by phone" is a definite step in the task, "Use telephone to accept and send customer orders," it is classified as a skill statement.

2. MANY TASKS HAVE MORE THAN ONE SKILL STATEMENT. Since many tasks consist of more than one definite step, they require more than one skill statement. Each skill listed in the example below is a definite step in the task, "Design simple corsage."

****
* EXAMPLE 2 *
****

Task	Design simple corsage
Skill 1	Wire flowers
Skill 2	Wire foliage
Skill 3	Floratape wire stems
Skill 4	Secure flowers and foliage
Skill 5	Feather carnations

Question 2.

Read the following statement and answer the question below.

Task	Use telephone to accept and send customer orders
Skill 1	Take order by phone
Skill 2	Send order

Are these two skill statements definite steps that need to be completed in order to "Use telephone to accept and send customer orders"?

Yes (turn to the next page)
No (turn to back of this page)

ANSWER TO QUESTION 2.

You thought that these two steps were not necessary in order to "Use telephone to accept and send customer orders." Perhaps I should explain a skill statement again. A skill statement is the psychomotor or performance elements that are needed to perform the task successfully. Every task has at least one skill statement and many have more. "Take order by phone" and "Send order" are definite steps of the task "Use telephone to accept and send customer orders." These statements are necessary skill statements, since they are definite steps that must be completed in order to successfully perform the task.

3. AN ACTION VERB SHOULD BE USED IN EVERY SKILL STATEMENT. Action is necessary in order to perform a task; therefore, the skill statement must show action. Skill statements provide a basis for student activities. By including action in the skill statements, the student will actually perform the skill instead of only discussing or observing the skill. The skill statements become actual steps that are used in performing a task.

In Example 3a the skill statements do not show action. These skill statements could easily be mistaken for unit titles or discussion topics.

****
* EXAMPLE 3a *
****

Incorrect

Task	Design simple corsage
Skill 1	Flower wiring
Skill 2	Foliage wiring
Skill 3	Wire stem taping
Skill 4	Securement of flowers and foliage
Skill 5	Carnation feathering

However, in Example 3b, specific verbs were used in the skill statement for identifying the action. By using action verbs, the statements have become the actual steps used in performing the task. When writing skill statements, try to avoid overusing general verbs such as perform and do. Instead use meaningful verbs that can be applied directly to the skill.

****
* EXAMPLE 3b *
****

Correct

Task	Design simple corsage
Skill 1	Wire flowers
Skill 2	Wire foliage
Skill 3	Floratape wire stems
Skill 4	Secure flowers and foliage
Skill 5	Feather carnation

Question 3.

Read the skill statements in these two examples and answer the questions below:

****
EXAMPLE A
****

Task	Construct planters and terrariums
Skill 1	Container preparation
Skill 2	Plant preparation
Skill 3	Preparation of drainage material
Skill 4	Media preparation
Skill 5	Procedures for planting terrarium or planter
Skill 6	Planter or terrarium accents

****
EXAMPLE B
****

Task	Construct planters and terrariums
Skill 1	Prepare containers
Skill 2	Prepare plants
Skill 3	Prepare drainage
Skill 4	Prepare media
Skill 5	Plant terrarium or planter
Skill 6	Accent terrarium or planter

Which example contains skill statements that do not reflect the guidelines that were discussed in this section.

Example A (turn to next page)
Example B (turn to back of this page)

ANSWER TO QUESTION 3.

You chose Example B as the example which does not reflect the guidelines stated in this section. However, the skill statements in Example B contain action verbs while the skill statements in Example A do not. The skill statements in Example A could be mistaken for unit titles or discussion topics. For this reason, you should use skill statements that contain action verbs. These skill statements should be actual steps that are used in performing a task. Example B contains skill statements which illustrate this concept.

4. SKILL STATEMENTS SHOULD BE CONCISE AND SPECIFIC. Non-essential words should be eliminated. In Example 4a, the skill statement "Correctly wire flowers to be used in the corsage" is long and wordy. In order to make this statement more concise and specific, several words can easily be omitted. The word, "Correctly" can be eliminated from the statement, since correct performance is expected and understood. The phrase, "to be used in the corsage" is also unnecessary since the skill is listed with the task, "Design simple corsage." It can be assumed that the wired flowers will be used in the corsage.

****
* EXAMPLE 4a *
****

Incorrect

Task	Design simple corsage
Skill	Correctly wire flowers to be used in the corsage

In Example 4b, the skill statement is brief, yet contains all the necessary information. The skill statement, "Wire flowers" tells the student exactly what needs to be done.

****
* EXAMPLE 4b *
****

Correct

Task	Design simple corsage
Skill	Wire flowers

Question 4.

Which of the following skill statements are concise, and yet still relay all the necessary information to the student?

Task	Set up a wedding
Skill Statement A	Correctly arrange the decorations that will be used in the wedding
Skill Statement B	Arrange wedding decorations

If you selected:
Skill Statement A (turn to back of this page)
Skill Statement B (turn to next page)

ANSWER TO QUESTION 4.

You thought skill statement A, "Correctly arrange the decorations that will be used in the wedding," was concise. It does contain all the necessary information, but I would hardly call skill statement A concise. The word "Correctly" can be eliminated from the statement, since correct performance is expected and understood. The phrase "that will be used in the wedding" is also unnecessary since the skill is listed with the task, "Set up a wedding." It can be assumed that the decorations will be used in the wedding.

Skill statement B, "Arrange wedding decorations," is concise but still contains the necessary information the student needs to learn. The statement tells the student exactly what needs to be done.

Writing Knowledge Statements

5. KNOWLEDGE STATEMENTS MUST BE WRITTEN FOR EACH TASK. Knowledge statements are the intellectual or cognitive elements that need to be learned in order for the student to perform the task successfully. In Example 5 the skill statement is "Wire flowers." In order to wire flowers, the student must know when and how to use the pierce, clutch, hook or hairpin methods of wiring flowers. Therefore, these three methods are listed as a knowledge statement.

****
* EXAMPLE 5 *
****

Task	Design simple corsage
Knowledge	What plant materials are best adapted for the pierce, clutch, hook or hairpin methods
Skill	Wire flowers using the pierce, clutch and hook or hairpin methods

Question 5.

In the following example, is "Telephone etiquette" a cognitive element that the student needs to know in order to "Take order by phone"?

Task	Use telephone to accept and send customer orders
Knowledge	Telephone etiquette
Skill	Take order by phone

Yes (turn to next page)
No (turn to back of this page)

ANSWER TO QUESTION 5.

You said that "Telephone etiquette" is not a cognitive element needed in order to complete the skill, "Take order by phone." Consequently, you are saying that "Telephone etiquette" should not be a knowledge statement. Yet, in order to take an order by phone you should know proper telephone etiquette. For this reason, "Telephone etiquette" is correctly listed as a knowledge statement.

6. KNOWLEDGE STATEMENTS SHOULD BE CONCISE AND SPECIFIC. Non-essential words should be eliminated. In Example 6a, the knowledge statement, "Know the correct way to wire flowers from the three basic methods," is long and wordy. The word "Know" is unnecessary because this sentence is listed as a knowledge statement. It can be assumed that the student will have to know the items in the statement. The phrase "the correct way to wire flowers" is also unnecessary and assumed since the knowledge statement is listed under the skill statement "Wire flowers."

The phrase "the three basic methods" is very general. By replacing this phrase with "the pierce, clutch, hook or hairpin method requirements" the knowledge statement becomes much more specific and meaningful (see Example 6b). By actually listing the items that need to be known, the knowledge statement also provides the items for a student mastery check list. The list enables the student to easily realize which specific items need to be known in order to perform a task. It also allows the teacher to easily record specific items as they are mastered by each student.

****
* EXAMPLE 6a *
****

Incorrect

Task	Design simple corsage
knowledge	Know the correct way to wire flowers from the three basic methods
Skill	Wire flowers

****
* EXAMPLE 6b *
****

Correct

Task	Design simple corsage
Knowledge	Pierce, clutch, hook or hairpin method requirements
Skill	Wire flowers

Question 6.

The two sets of knowledge and skill statements below are used in the task, "Set up a wedding." However, one knowledge statement is long and wordy while the other is more concise. Select the knowledge statement that is stated concisely.

Task	Set up a wedding
Knowledge A	Know the correct placement of the wedding materials
Skill	Arrange wedding decorations
Knowledge B	Placement of wedding materials
Skill	Arrange wedding decorations

If you selected:

Knowledge A (turn to the back of this page)

Knowledge B (turn to next page)

ANSWER TO QUESTION 6.

You selected knowledge statement A, "Know the correct placement of the wedding materials," as the concisely written knowledge statement. However, in this statement the word, "Know" is unnecessary. It can be assumed that the student will have to know the items in the statement since it is listed as a knowledge statement. The word "correct" can be eliminated since correct performance can be assumed. By making these changes, the knowledge statement becomes more concise (see example below).

Task	Set up a wedding
Knowledge A	Placement of wedding materials
Skill	Arrange wedding decorations

7. KNOWLEDGE STATEMENTS ARE NOT JUST THE "HOW TO" STEPS OF THE SKILL STATEMENTS. The knowledge statements contain information the student needs to know in order to apply the skill and/or complete the skill. These statements are most useful when they are specific and detailed.

In Example 7a, the knowledge statement is "How to wire flowers." However, the student needs to know more than just how to wire flowers in order to "Design a simple corsage." The student needs to know the three specific methods of wiring flowers, when to use each method, and with what flowers. Example 7b demonstrates how to detail and specify a generalkknowledge statement.

EXAMPLE 7a

Incorrect

Task	Design simple corsage
Knowledge	How to wire flowers
Skill	Wire flowers

EXAMPLE 7b

Correct

Task	Design simple corsage
Knowledge	Pierce, clutch, hook or hairpin method requirements
Skill	Wire flowers

Question 7.

Using the previously mentioned guidelines, select the detailed knowledge statement that is correctly written.

Task	Use telephone to accept and send customer orders
Knowledge A	How to take order by telephone
Skill	Take order by phone
Knowledge B	Telephone etiquette
Skill	Take order by phone

If you selected:

Knowledge A (turn to back of this page)

Knowledge B (turn to next page)

ANSWER TO QUESTION 7.

You selected knowledge statement A, "How to take order by telephone," as the correct detailed knowledge statement. However, knowledge statements should not be merely the "how to" of the skill statement. The knowledge statement should contain the items that need to be learned in order to perform the skill. Knowledge statement A can become more specific and detailed by changing it to read "Telephone etiquette." Students should know proper telephone etiquette before they take customers' orders over the telephone.

8. KNOWLEDGE STATEMENTS DO NOT CONTAIN ACTION VERBS. Knowledge statements contain the cognitive elements required to complete the task. The statements contain items the student needs to know in order to complete the task and are not the actual performance of the task. Therefore, the knowledge statements do not contain action and do not require an action verb. In Example 8a, the action verb "use" is included in the knowledge statement. Example 8b demonstrates how to write a knowledge statement without an action verb.

****
* EXAMPLE 8a *
****

Incorrect

Task	Design simple corsage
Knowledge	Use combination pierce and clutch method
Skill	Wire foliage

****
* EXAMPLE 8b *
****

Correct

Task	Design simple corsage
Knowledge	Combination pierce and clutch method
Skill	Wire foliage

Question 8.

Does the example below contain a well-written knowledge statement?

Task	Construct planters and terrariums
Knowledge	Use containers suited for occasion
Skill	Prepare containers

Yes (turn to back of this page)
No (turn to next page)

ANSWER TO QUESTION 8

You thought that the knowledge statement, "use containers suited for occasion" is well written. Yet it contains the action verb, "use" and since knowledge statements do not show action, they do not require an action verb. Therefore, the word "use" can be omitted, so the knowledge statement reads, "Containers suited for occasion."

9. MANY SKILL STATEMENTS HAVE MORE THAN ONE KNOWLEDGE STATEMENT. Since many skill statements require more than one intellectual or cognitive element in order to perform the skill, more than one knowledge statement may be needed in order to relay the information to the student (see Example 9a).

****
* EXAMPLE 9a *
****

	Correct
Task	Design funeral basket
$Knowledge_1$	Proper foundation materials
$Knowledge_2$	Proper securing methods
Skill	Prepare container

However, more than one knowledge item can be listed per knowledge statement.

****
* EXAMPLE 9b *
****

	Correct
Task	Design simple corsage
Knowledge	Pierce, clutch, hook or hairpin methods
Skill	Wire flowers

How Many Knowledge Statements Do I Need?

Use only one knowledge statement when:

a. cognitive items are used in order to perform a single action

b. cognitive items are mutually exclusive

In Example 9b the knowledge statement contains items which are methods of wiring flowers. The methods are all used to perform the single action of wiring flowers. The knowledge items are also mutually exclusive.

When you are using one method of wiring flowers (such as the pierce method), you will not be using any of the other methods of wiring flowers. Therefore, the 3 methods of wiring flowers: pierce, clutch, hook or hairpin, are all listed in one knowledge statement.

Use more than one knowledge statement when:

a. cognitive items are used to perform separate actions

In Example 9a, since the two knowledge items are used to perform two separate actions, they are listed separately. In the first statement, the student must know the foundation materials that are available, as well as the containers and flowers that can be used with each of the foundation materials. Secondly, the student must know the methods of securing foundation materials to containers, the containers best used for each method, and the foundation material best adapted to each method. Therefore, the cognitive aspects of preparing a container are listed as two knowledge statements.

Question 9.

In the example below, is it correct to use 3 knowledge statements to list the knowledge items instead of using only one statement?

Task	Give cost estimates of weddings
$Knowledge_1$	Wedding design markup
$Knowledge_2$	Labor requirements
$Knowledge_3$	Materials used in design
Skill	Estimate cost for wedding design

Yes (turn to the next page)
No (turn to the back of this page)

ANSWER TO QUESTION 9.

"You said that it was not correct to use three knowledge statements to relay the three knowledge items. Yet, the three items are used to perform separate actions. "Welding design markup, Labor requirements, and Materials used in design" are all used to perform three separate actions. Consequently, the three knowledge items should be listed separately in three knowledge statements.

CHAPTER FOUR REVIEW

DIRECTIONS:

Below are the knowledge and skill statements used in the unit, "Displaying Merchandise." However, some of the knowledge and skill statements contain mistakes. Using the mistake clues, locate and correct the mistakes. Use the work sheet on the following page to rewrite statements.

DISPLAYING MERCHANDISE

		Mistake Clues	See Example
Task 1	**Stock shelves**		
Knowledge A	Perform inventory of stock	Has action verb	8b pg. 33
Knowledge B	Stock shelf organized in effective manner	Long and wordy	6b pg. 27
Skill	Stock and supplies replenishment	No action verb	3b pg 20
Task 2	**Establish and maintain display areas**		
Knowledge A	Know display types	Understood word	6b pg. 27
Knowledge B	Use of color coordinates in the display	Inessential word and long & wordy	6b pg. 27
Knowledge C	Know steps used in maintaining display	Inessential word and long & wordy	6b pg. 27
Skill	Correctly display merchandise	Inessential word	4b pg. 23
Task 3	**Set up display area**		
Knowledge	Impulse item location and use of background	Only one knowledge statement	9a pg. 35
Skill	Effective display construction of display area	No action verb, long & wordy	4b pg. 23
Task 4	**Check invoices of received merchandise**		
Knowledge A	How to check damaged items	Not "how to"	7b pg. 30
Knowledge B	Know which items are missing	Inessential word, long & wordy	6b pg. 27
Skill	Check merchandise received with invoice	No mistakes	--

DISPLAYING MERCHANDISE

Worksheet

Task 1 Stock shelves

Knowledge A _____

Knowledge B _____

Skill _____

Task 2 Establish and maintain display areas

Knowledge A _____

Knowledge B _____

Knowledge C _____

Skill _____

Task 3 Set up a display area

Knowledge A _____

Knowledge B _____

Skill _____

Task 4 Check invoices of received merchandise

Knowledge A _____

Knowledge B _____

Skill _____

After you have corrected the mistakes, check your answers with those on the next page.

ANSWERS TO CHAPTER FOUR REVIEW

DISPLAYING MERCHANDISE

Task 1	Stock shelves
Knowledge A	Stock inventory
Knowledge B	Stock organization
Skill	Replenish stock & supplies
Task 2	Establish and maintain display areas
Knowledge A	Display types
Knowledge B	Color coordinates
Knowledge C	Display maintenance
Skill	Display merchandise
Task 3	Set up display area
Knowledge A	Impulse item location
Knowledge B	Use of backgrounds
Skill	Construct display
Task 4	Check invoices of received merchandise
Knowledge A	Damaged items
Knowledge B	Missing items
Skill	Check merchandise received with invoice

Chapter 5

Preparing Teaching Materials

Introduction

The list of skill and knowledge statements developed in chapter five provides a good teaching outline. The process described in this chapter is one which transforms the industry-based outline into materials which a teacher can use in the vocational classroom. These materials must include answers to the knowledge statements of chapter five as well as a description of how to perform the skill statements.

Writing Questions and Answers

First, let us examine how the knowledge statements can be transformed into teaching materials. Each knowledge statement can usually be developed into a series of questions and answers. The ability to answer these questions should provide the knowledge necessary to successfully perform a related skill or task. For example, the unit "Design Corsage" has a knowledge statement titled "Pierce, clutch, hook or hairpin method requirements." This knowledge statement does not provide the specific details which need to be learned. The questions and answers which follow this knowledge statement will provide the information which needs to be learned by the student.

SAMPLE

Knowledge Teaching Material

Unit Title: Design Corsage

Knowledge Statement: Pierce, clutch, hook or hairpin method requirements

Question: What are the 3 basic wiring methods for corsage design?

Answer:
1. Clutch
2. Pierce
3. Hook or hairpin

Question: What are the common uses of the hook or hairpin method?

Answer:
1. Daisies using #24 gauge wire
2. Pompons using #24 gauge wire
3. Stephanotis using #28 gauge wire

Question: What are the common uses of the pierce wiring method?

Answer:
1. Carnations using #24 gauge wire
2. Roses using #24 gauge wire
3. Gardenias using #24 gauge wire
4. Some orchids using #24 gauge wire

Question: What are the common uses of the clutch wiring method?

Answer:
1. Feathered carnations using #24-26 gauge wire
2. Lily-of-the-valley using #26 gauge wire
3. Gladiolas using #26 gauge wire
4. Some orchids using #24 gauge wire

You may notice that the detail provided by this method makes the material useful for self-instruction or independent study. If the vocational teacher doesn't know what questions or answers should follow each knowledge statement, the industry interview personnel can again be used as a resource.

Writing Skill Steps and Key Points

Once the knowledge statements are developed into teaching materials the skill statements need to be detailed. One method found to be useful by teachers is to list the steps in performing the skill and adding key points to the steps as needed. The sample skill 'Wire flowers' is subdivided into different methods of wiring flowers. Each method is treated as a skill and is detailed by adding steps and key points.

****
* SAMPLE *
****

Skill Teaching Material

Unit Title: Design Corsage

Skill Statement: Wire flowers

Skill Name: Wire flowers using the pierce method

Steps in performing skill	Key point or key points for each step
1. Pierce wire through the Calyx	
2. Pull wire down next to stem	2. Wire ends should be of equal lengths

****
* SAMPLE *
****

Skill Statement: Wire flowers

Skill Name: Wire flowers using the hook or hairpin method

Steps in performing skill	Key point or key points for each step
1. Make a 2" hook on the end of the wire	
2. Insert wire through center of the flower	
3. Pull wire & hook through the flower so wire is hidden in the flower	3. Be careful not to pull wire too tight and cut the flower in half

Once again, the amount of information provided by this system allows the material to be used as self-instruction or independent study guides as well as teaching plans for the instruction.

Skill Test Check List

Teachers who have used the competency based approach have indicated that evaluation of skill performance is best when a skill check list is used. The check list serves as a reference for the person being tested as well as a guide for the teacher who checks the student's performance. The following provides an example of how a check list can be developed.

CORSAGE DESIGN

EVALUATION CHECK LIST

Maximum Score = 100 points

STUDENT NAME_____

____1. Does the corsage have a pleasing size and shape?

____2. Is the corsage light and airy?

____3. Is the corsage lightweight and comfortable to wear?

____4. Is color used effectively?

____5. Does the corsage follow design principles such as flower color, foliage, and ribbon/bow selection?

____6. Is the corsage attractive from the side as well as from the front?

____7. Are the mechanics in the corsage good?

___wire covered ___flowers properly wired

___wires neatly taped ___proper selection of wire #, gauge and length

____8. Will the corsage hold together throughout the planned activities?

____9. Is the size of the corsage correct for its price and the size of the person wearing it?

____10. Is the overall appearance of the corsage pleasing?

1. What is the format for preparing teaching materials for knowledge statements?

2. What is the format for preparing teaching materials for skill statements?

3. What is the advantage of preparing written teaching materials for knowledge and skill statements?

ANSWERS FOUND ON PAGE 46

ANSWERS TO CHAPTER FIVE REVIEW

1. Use the question and answer format.

2. Use a list of steps with key points as needed.

3. The teaching materials provide sufficient detail to be used as self-instruction or independent study materials as well as a teacher lesson guide.

Chapter 6

Evaluate and Record Student Achievement

Introduction

When competency based teaching materials have been completed, student evaluation should center around the skill and knowledge statements needed to perform work tasks. Skills may be performed and evaluated both in the classroom and on the job. The on-the-job evaluation by an employer gives the student a considerable advantage if the evaluation is later used to obtain full-time employment. Other employers seem to pay special attention to work evaluations made by fellow business persons. The check list sample below provides an idea of the format which can be used to evaluate student performance.

ON-THE-JOB EVALUATION FORM

STUDENT NAME: _____ COOPERATING BUSINESS: _____

TEACHER'S NAME: _____ WORK SUPERVISOR: _____

DATES OF EMPLOYMENT: _____

DESIGNING CORSAGE

		Possible Uses	
		Check when completed by student	Validation by on-the-job supervisor
	Make bows		
Knowledge	Complementary ribbon color and size		
Skill	Construct bow with #3 ribbon		
	Design simple corsage		
Knowledge$_1$	Pierce, clutch, nook or hairpin method requirements		
Skill$_1$	Wire flowers		
Knowledge$_2$	Combination pierce & clutch method requirements		
Skill$_2$	Wire foliage		
Knowledge$_3$	Floratape colors		
Skill$_3$	Floratape wire stems		
Knowledge$_4$	Placement of flowers, foliage & bow		
Skill$_4$	Secure flowers and foliage		
Knowledge$_5$	Feathered carnation uses		
Skill$_5$	Feather carnations		
	Design advance corsage		
Prerequisite: Design simple corsage			
Knowledge$_1$	Placement of flowers, foliage & bow		
Skill$_1$	Assemble corsage		
Knowledge$_2$	Special treatments for handling orchids or gardenias		
Skill$_2$	Design using orchids or gardenias		

Classroom Tests

Classroom test or exams can also be developed using the competency based teaching materials. The question and answer format of the knowledge needed to successfully perform work tasks serves as the basis for pencil and paper tests. The example quiz demonstrates how the questions and answers of knowledge statements can be used to prepare a written test.

DESIGNING CORSAGE QUIZ

STUDENT NAME:_____ TEST SCORE:_____

10 pts. 1. Match

Flower		Wiring Method
a.____	Carnation	1. Pierce
b.____	Gardenia	2. Clutch
c.____	Daisy	3. Hook or hairpin
d.____	Feathered carnation	
e.____	Rose	
f.____	Pompon	
g.____	Stephanotis	
h.____	Lily of the Valley	
i.____	Orchid	
j.____	Gladiola floret	

10 pts. 2. Fill in

a. Number _____ ribbon is used for most corsage bows.

b. _____ floratape is most commonly used in corsages and bouquets because of its natural color.

c. In order to achieve balance, the _____ and _____ in color should be used as the top flower of the corsage.

d. _____ should be used to frame the flowers in corsage, instead of overpowering them.

KEY TO QUIZ: 1. 1; 1; 3; 2; 1; 3; 3; 2; 1 or 2; 2
2. 3; Green; smallest and lightest; Foliage

CHAPTER SIX REVIEW

1. What form should skill evaluation tools be in?
2. What form should knowledge evaluation tools be in?
3. How can both teacher and work supervisors evaluate student progress?

ANSWERS FOUND ON PAGE 50

ANSWERS TO CHAPTER SIX REVIEW

1. A check list of pre-determined criteria assists both the student and teacher in skill performance and evaluation.

2. A pencil and paper test can easily be developed from the questions and answers which follow each knowledge statement.

3. A list of skill and knowledge statements for each teaching unit can be made. This list can then be used to evaluate and record student progress.

APPENDIX F

Sample Locally Directed Competency Based Teaching Unit

BEDDING PLANTS

Identification

Identifying greenhouse bedding plants:

How are bedding plants identified according to use?
1. Edging plants
2. Border plants
3. Bedding plants
4. Cutting flower plants
5. Background plants
6. Container plants

What are the advantages of using an assortment of bedding plants:
1. Larger assortment of color, form, foliage type and plant height
2. Relatively longer flowering season

Plant selection:

Which bedding plants to recommend:

Alternatives	Factors
1. Flower colors	1. Where will they be planted?
2. Season of bloom	
3. Plant height	3. In what types of planting will they be used?
4. Growing conditions	4. Location: Sun or shade
5. Type of planting (bed, flower box, border, edging, hanging basket, etc.)	5. Plant height, spacing, sun or shade

Select bedding plants for specific situation:

Steps	Key Points
1. Select plants according to location	1. Low growing for edging and borders; taller (14-24") for center of bed; tall (over 24") for background; short, spreading types for baskets, urns, and window boxes
2. Select for color preference	2. Colors may be kept solid, blended, or contrasted
3. Select for heat tolerance	3. Many bedding plants will not tolerate full summer sun

Symptoms of disease:

What are the common diseases of bedding plants and their symptoms?
Aphids - curling of leaves, deformity of buds (easily controlled by most insecticides).
Damping-off - rotting of stem at soil level (prevent by using sterilized soil, soilless media or/and allowing media to dry between watering. A fungicidal drench may be used).
Botrytis - attacks upper plant parts. Infected plants die and are covered with grey mold. (Fungicidal sprays, discarding infected plants, increasing air circulation and keeping foliage dry help deter disease).

What are the qualities of healthy bedding plants?
1. Sturdy, bushy growth and deep green leaves

Select healthy and vigorous plants:

Steps	Key Points
1. Examine plants for curled leaves, damaged buds, dark or discolored stems, or evidence of molds	1. Plants should appear sturdy, bushy and present deep green leaves

Adjust growing conditions:

Steps	Key Points
1. Use loose, quick draining sterile media	1. 1/2 peat; 1/2 perlite or soilless mix
2. Provide adequate moisture for germination	2. Check daily for moisture
3. Provide proper temperature for germination	3. 65-70° night; 75-78° day
4. Provide proper temperature for maturation	4. 55-60° night; 60-65° day
5. When pair of true leaves have appeared, prick off	5.
6. Fertilize transplants regularly	6. Use balanced 20-20-20 fertilizer
7. Speed or retard growing rate by manipulating temperature or using retardant	7. 45-50° night; 50-65° day to retard. 70-75° to hurry A-peat or B nine

4. Select for blooming habits	4. Each type of plant has its time of bloom
5. Select for plant spacing	5. Leave a space between plants of approximately one-half its height

Cultural practices:

What are the cultural practices for growing bedding plants?

1. Start plants on proper growing schedule
2. Begin plants in flats and transplant to market packs
3. Use loose quick draining medium
4. Medium should be sterilized
5. Sow in rows except for very fine seeds
6. Provide constant moisture by misting
7. Remove cover when germination starts
8. 65-70° night temperature; 75-78° day temperature during germination
9. After most have germinated--55-60° nights, 60-65 days
10. Still keep moist but drier than germination
11. When true leaves appear, transplanting may occur
12. Use a pencil to prick off seedlings
13. Handle seedlings by leaves
14. Tomp soil around transplant
15. Gently water in
16. Label market packets at transplanting
17. Fertilize regularly with 20-20-20 with water
18. Slow or speed up growth by regulating temperature (45-50° to slow, 50-65° day). (70° night, 75° day to hurry)
19. Or use growth retardants which do not inhibit flowering

Plant names:

What are the bedding plant crops marketed in the midwest area?

Vegetables: Tomatoes (Better Boy, Early Girl, Beefmaster, Small Fry, Patro); Peppers (Bell Boy, California Wonder, Hungarian Yellow Wax, Long Red Cayenne); Muskmelon (Classic, Burpee Hybrid); Eggplant (Royal Knights, Beauty); Cabbage (Flat Top, Emerald Cross).

Flowers: Ageratum, Alyssum, Asters, Begonias, Coleus, Dusty Miller, Impatiens, Lobelia, Marigold, Pansy, Petunia, Phlox, Salvia, Snapdragon, Verbena, Zinnia

Apply proper name:

Steps	Key Points
1. Given bedding plants or bedding plant photographs apply the correct common name to plant	

Harvesting greenhouse bedding plants:

When are greenhouse grown bedding plants ready for harvest?
1. When they are developed well enough to be transplanted outside
2. After they have been hardened off

Harden off bedding plants:

Steps	Key Points
1. Move transplanted seedlings outside	1. Place transplant tray up off the ground
2. Observe temperature	2. Seedlings must not freeze
3. Extend hardening time gradually	3. Begin with two hours per day
4. Water whenever plants begin to wilt	4. Strong sunlight and wind cause excessive drying

Harvest bedding plants:

Steps	Key Points
1. Select plants which are appealing to the prospective customer	1. Sturdy,well-branched, deep green, well-rooted (showing some flower color if possible)
2. Place identification tag into each pack	2. Customer needs to identify each pack

Sorting bedding plants for quality:

Why should bedding plants be quality sorted?
1. High quality is most appealing and gives the greatest return
2. Smaller plants can be held back to extend the sale season

Sort bedding plants for quality:

Steps	Key Points
1. Select for uniformity of: height, foliage color, root development; hardiness	1. All plants in a tray should be as uniform as possible
2. Select plants with some flower color	2. Most customers will purchase plants showing some color more readily
3. All pack should be full of live plants	3. Transplant to get a live plant in each cell
4. Tag all packs before displaying	4. Identify each pack in the tray

Chapter Title Bedding Plants

QUALITY SORT BEDDING PLANTS
Score Card (Skill Check Sheet)

Items	Maximum Score	Your Score
1. Does each cell in the tray contain a live plant?	10	
2. Are all plants uniform?	10	
3. Do any plants indicate insect damage?	10	
4. Do any plants indicate the presence of disease?	10	
5. Are all plants dark green in color?	10	
6. Do all plants show a well developed root system?	10	
7. Is there any indication the plants are suffering from the lack of moisture?	10	
8. Have all the plants been pinched to induce branching?	10	
9. Are all plants in the tray "true" to variety?	10	
10. Do some plants in the tray show some buds or flowers?	10	
	100	

LESSON TITLE	Chapter 11 Bedding Plants
INSTRUCTOR NOTES	LESSON SCRIPT

Identify Bedding Plants

KEY

Matching

E _____ 1. Plants that take more than one year to complete their life cycle

C _____ 2. Low growing plants (less than 10")are used for

G _____ 3. Tall plants (24"-36") are used for

J _____ 4. Using a variety of bedding plants usually prolongs the

A _____ 5. The annual that has the greatest assortment of colors is

D _____ 6. An example of an annual used as a dried flower

I _____ 7. Often carried through the winter as a flowering houseplant

B _____ 8. The annual that does very well in reseeding itself

H _____ 9. An annual most resistant to insects

F _____10. Used as a filler flower for arrangements

A. Petunia
B. Marigold
C. Edging
D. Helichrysum (straw flower)
E. Perennials
F. Gypsophila (baby's breath)
G. Background
H. Portulaca (rose moss)
I. Geranium
J. Flowering season

LESSON TITLE	Chapter 11 Bedding Plants
INSTRUCTOR NOTES	**LESSON SCRIPT**
	Bedding Plant Uses Fill in the blank:
seed started plants	1. Bedding plants may be started from _____ or bought as _____.
petunia	2. The most widely used bedding plant is the _____.
edging borders	3. Usually the low growing bedding plants are used for _____ and/or _____.
annuals	4. Bedding plants that complete their life cycle in one year are called _____.
background	5. Tall flowering plants are used as _____ _____ plants.
flower color	6. Annuals are mass planted to emphasize their large assortment of _____.
frost is passed	7. Most annuals should be planted outdoors after the danger of _____.
6-8 weeks	8. Seed flowering annuals _____ prior to outside planting.

Germinating Seeds

Performance Objective: Given a quantity of seeds the student shall be able to successfully germinate them according to the task statements given below (taken from VAS 50102) as judged by the teacher.

Introduction: Flowering annuals are grown throughout Illinois and most of the United States. They come in a myriad of kinds and colors and are an important part of garden center sales. The purpose of this task sheet is demonstrate and accepted and easy method of seed germination applicable not only to annuals but to other kinds of seeds as well.

Materials:

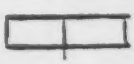
A seed flat
Soil mixture (1 part loam, 1 part shredded peat moss, 1 part sand or perlite)
A place to sterilize soil
Vermiculite
Seeds
Theram or Captan fungicide
Board ½" thick and not quite as long as the width of the seed flat.

Skills:

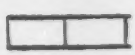
Knowledge:

Task Statements and Evalutation

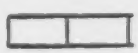
1. Sterilize the flat and any tools which will come into contact with the soil mixture during the operation.



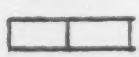
2. Lightly cover the holes or cracks in the bottom of the flat with sphagnum mass to hold in the soil and to maintain adequate drainage. Fill the flat up to 3/4" from the top with soil mixture.



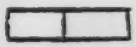
3. Level and gently firm the soil and then moisten it by sprinkling or by setting it in water. Allow all excess water to drain from flat.



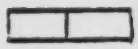
4. Pour vermiculite on soil to a ½" depth and level it. When using small seeds use less vermiculite. Gently wet the vermiculite using a sprayer. Using a ½" wide strip of wood make depression 1/8" to ¼" deep in the moist vermiculite. The depressions should be about two inches apart and are the rows or drills into which the seed is to be sown.



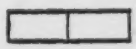
5. Treat the seed with a protective fungicide such as theram or captan by placing an amount equivalent to a matchhead into the seed envelope. Ballon the envelope and shake it vigorously to dust each seed. Do not treat already treated seeds a second time.



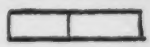
6. Sow seeds thinly and uniformly along the drills. Tap the envelope with your forefinger to roll out the seeds as you move the envelope along the drill. Small seeds may be brodcast over the entire surface of the flat rather than in drills. Cover with wet newspaper, plastic film or glass. Remove cover as germination occurs.



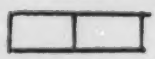
7. Cover seeds with a thin layer of vermiculite except small seeds as noted above. Moisten with a fine spray. A light dusting with 5 percent captan is advised. Place the flat in a draft free room or greenhouse in a semi shaded location.



8. Water only as necessary. Check moisture twice a day. Apply water gently.



9. Move the flat to a cooler location (55°F night, 65-75° F day) when germination occurs to prevent spindly growth. Choose a well ventilated spot in full sunlight.



10. Transplant seedlings as soon as they are big enough to handle conveniently. This is usually when the first true leaves appear. Never let the seedlings become overgrown before "pricking off" (transplanting into pots, bands, or flats).

Note: Should damping off occur try to arrest it by a prompt and thorough fungicide drench. Use 1 tablespoon of Captan per gallon of water.

Chapter Title: Chapter 11 Bedding Plants

ACTIVITY FORM

INTRODUCTION:

You have been employed part time by a greenhouse and garden center owner. So far this year you have cleaned in the greenhouse, mixed potting soil, watered seedlings, and have done odd jobs wherever needed, but you have been able to get only 15 hours of work per week.

Last week you asked the manager if he could give you more hours. He said that for the next eight weeks the garden center will need additional help on the weekend and you could work an additional 16 hours if you want.

The additional hours will involve carrying out orders, keeping items stocked, marking prices, selling to the customers, and answering their questions.

You decide to take the job.

PROBLEMS:

1. Your first customer wants a short, blue flowered plant that will grow well in the sun. You would recommend--
   a. ageretum
   b. coleus
   c. gypsophila
   d. zinnia

2. A plant to recommend to this customer for dried flowers would be--
   a. begonia
   b. geranium
   c. strawflower
   d. impatiens

3. An excellent plant for multicolored hanging baskets would be--
   a. snapdragon
   b. cockscomb
   c. baby's breath
   d. petunia

4. A plant to recommend for a trellis would be--
   a. coleus
   b. marigold
   c. morning glory
   d. rose moss

5. A plant to recommend for cut flowers would be--
   a. impatiens
   b. petunia
   c. marigold
   d. snapdragon

6. A plant that would bloom in fall and would not have to be planted each year would be--
   a. geranium
   b. chrysanthemum
   c. alyssum
   d. aster

7. A grandmother and her grandson ask for a small, easy to grow, brightly flowered, long lasting plant that will tolerate full sun. You would recommend--
   a. dwarf marigold
   b. dwarf baby's breath
   c. ponpy
   d. none of these

8. A customer comes to you with--
   3 packs of ageretum @ 89¢ each
   2 packs of marigolds @ 79¢ each
   4 geraniums @ $1.19 each
   2 bags of organic peat @ $1.80 each on sale at 20 % off.
The bill for these items would be--(Tax is 5%)
   a. $12.61
   b. $11.89
   c. $12.48
   d. $13.24

9. The customer gives you a $20 bill. How much change would you return to him?--
   a. $ 7.39
   b. $ 8.11
   c. $ 7.52
   d. $ 6.76

10. If the customer gave you a $28 check for the items, the change would be--
   a. $15.39
   b. $16.11
   c. $15.52
   d. $14.76

ACTIVITY FORM ANSWER SHEET

1. A. ageretum
2. C. strawflower
3. D. petunia
4. C. morning glory
5. D. snapdragon
6. B. chrysanthemum
7. A. dwarf marigold
8. C. $12.48
9. C. $7.52
10. C. $15.52

1. a) Xerox prints can be made of the bedding plants commonly grown in the midwest. Xerox prints can ge given to students to identify.

   b) Photographs clipped from seed catalogues can be compiled into a classroom catalogue or classroom bulletin board display or

   c) 2 x 2 slide sets can be used to learn identification.

   d) Make a collection of bedding plant seed packets for a classroom scrapbook or bulletin board.

2. Plant 3 or 4 tomato seeds in each of two small pots. Place one pot in the greenhouse in a sunny spot. Place the second pot on a table in your classroom near a window. Take good care of both pots of plants. Examine them for 5 or 6 weeks making notes of their appearance at the end of each week.

3. Plant 3 or 4 tomato seeds in each of two pots. Place both pots in the greenhouse in a sunny location. After the plants come up water one pot only when needed. Water the second pot constantly so that the soil is always wet. Examine....

4. Plant 3 or 4 tomato seeds in each of two pots. For the growing media in one pot use pure sand. For the growing media in the second use a standard soil mix. Examine.....

Chapter Title Bedding Plants

BEDDING PLANT CROSSWORD CLUES

Down

1. Full sun
   Edging plant
   Flossflower

2. Colorful
   Edging plant
   Pansy

4. Red, pink, white
   Pelargonium

6. Sun or partial shade
   Grown as a biennial
   Digatalis

7. Blooms Sept. to frost
   Perennial
   Mum

10. Blooms early
    Difficult to transplant
    Papaver

13. Fragrant flowers after dark
    18"-24" tall
    Flowering tobacco

14. Excellent dried flowers
    Strawflowers

15. Makes an attractive house plant
    24"-36" tall
    Spiderflower

Across

3. Filler flower for arrangements
   Baby's breath

5. Blooms all summer
   4"-6" tall
   Sweet alyssum

8. Reseeds by itself
   Edging plant
   Rose moss

9. No insect problems
   6"-48" tall
   Tagetes

11. Bulbs or rhizomes
    Height to 30"
    Sun or partial shade

12. Popular corsage flower
    Popular in arrangements
    Dianthus family

16. Most widely used annual
    Singles, doubles, bi-colors
    Bed, baskets, flower boxes

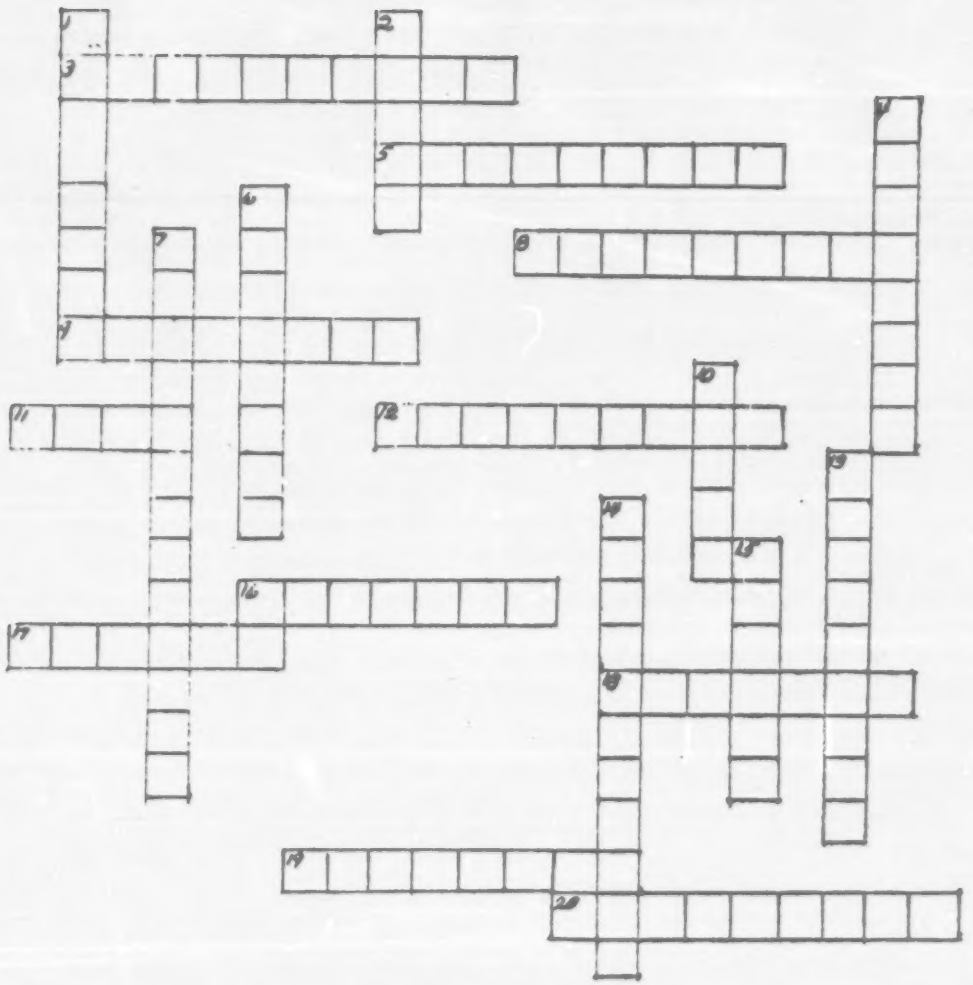
17. Partial to full sun
    Used for its foliage shape and colors

18. Plume or crested
    Excellent dried flower
    Cockscomb

19. Very fragrant flowers
    6"-18" tall
    Also called pinks

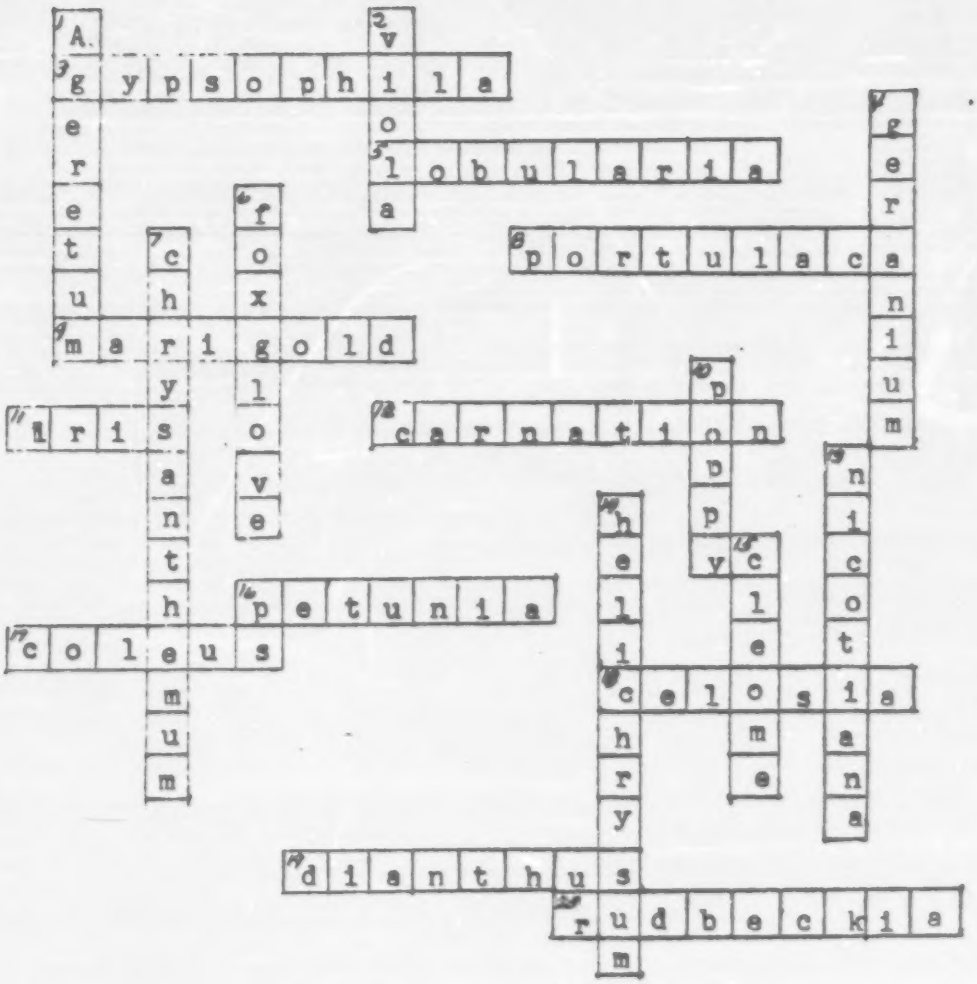
20. Blooms midsummer to fall
    30-36" tall
    Cone flower

BEDDING PLANT CROSSWORD

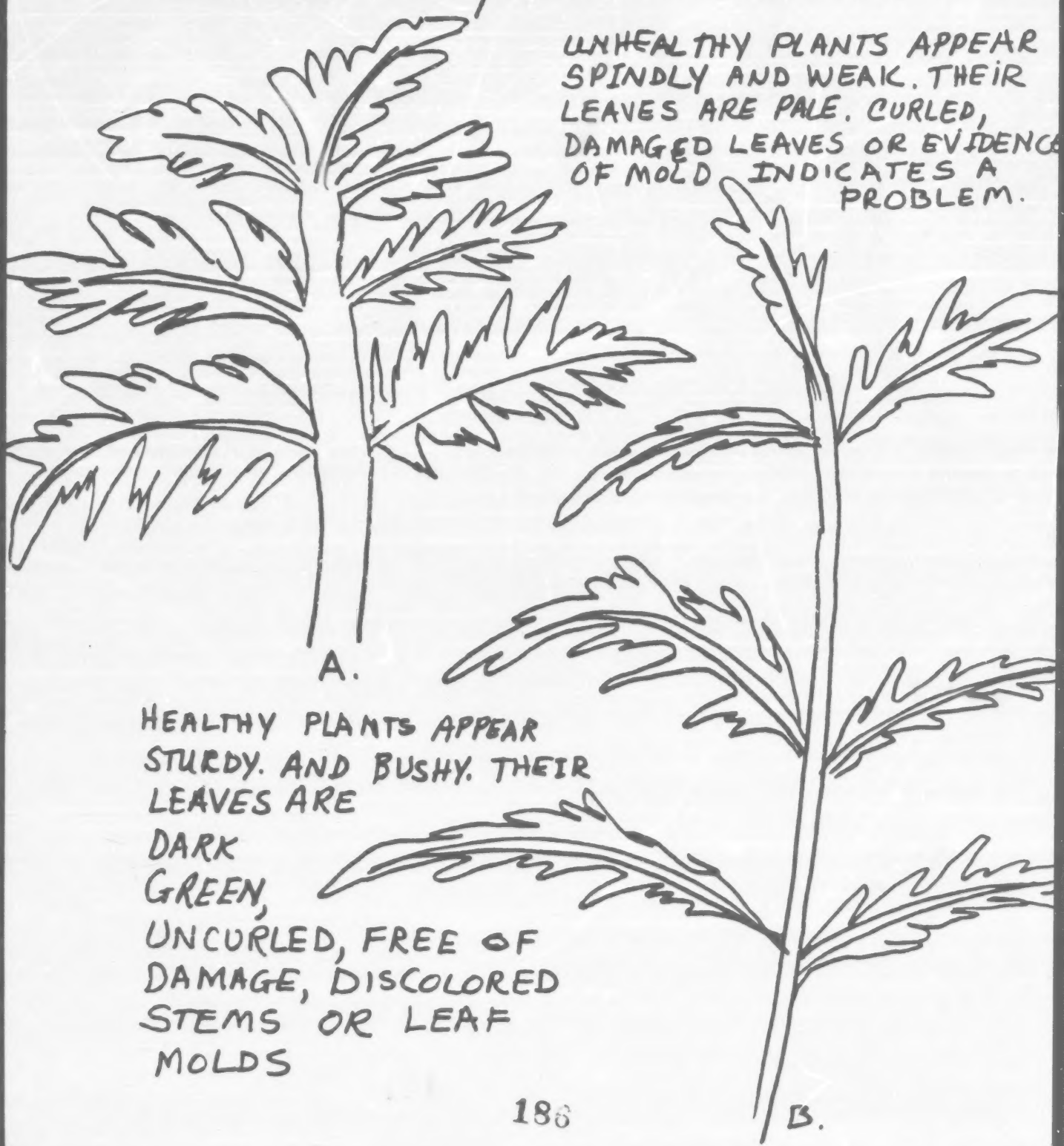


KEY

BEDDING PLANT CROSSWORD



HEALTHY/UNHEALTHY



UNHEALTHY PLANTS APPEAR SPINDLY AND WEAK. THEIR LEAVES ARE PALE. CURLED, DAMAGED LEAVES OR EVIDENCE OF MOLD INDICATES A PROBLEM.

A.

HEALTHY PLANTS APPEAR STURDY. AND BUSHY. THEIR LEAVES ARE DARK GREEN, UNCURLED, FREE OF DAMAGE, DISCOLORED STEMS OR LEAF MOLDS

B.

APPENDIX G

List of Grain Elevators and Meat Processors Interviewed

COUNTRY GRAIN ELEVATORS INTERVIEWED AND PERSONS CONTACTED

REGION I:

Central Commodities Ltd. Gary Hulstedt, Manager 1140 West Locust Street Belvidere, Illinois 61008	Large - Single
Henry Service Co. Maurice Martin, General Manager 101 N. East Street Cambridge, Illinois 61238	Small - Multiple
Hillsdale Co-Op Elevator Co. Bill G. Matley, Manager P. O. 265 Hillsdale, Illinois 61257	Medium - Single
Lee F.S., Inc. (Mail Amboy) Judy Boyle, Assistant Manager P. O. 46 Lee Center, Illinois 61331	Large - Multiple

REGION II:

Eminence Grain & Coal Co. Betty Kindred, Secretary Rural Route 1 Atlanta, Illinois 61723	Medium - Single
Farmers Grain Company Verome T. Rowe Chestnut, Illinois 62518	Large - Multiple
Musselman Building & Grain, Inc. Ralph Girard, Manager Toulon, Illinois 61483	Small - Single
Woodson Farmers Elevator Co. Paul Sheehan, Manager Woodson, Illinois 62695	Medium - Multiple

REGION III:

The Bement Grain Co. Richard Thomas, Manager 400 E. Bodman Bement, Illinois 61813	Large - Single
Effingham - Clay Service Co. Dave Hunt 410 S. Willow Effingham, Illinois 62401	Medium - Multiple
Moweaqua Farmers Co-Op Grain Co. James W. Shaw, Manager 129 W. Main Moweaqua, Illinois 62550	Large - Single
Oblong Grain & Feed Co. Russell Murrell, Manager 314 S. Range Oblong, Illinois 62449	Medium - Single
T & D Grain & Feed Kenneth Tipsword, Manager Beecher City, Illinois 62414	Small - Single

REGION IV:

Okawville Farmers Elevator Co. Wallace J. Klingenberg, Manager Okawville, Illinois 62271	Medium - Multiple
Twin Country Service Co. Gib H. Highlander, General Manager P. O. Draw N Marion, Illinois 62959	Small - Multiple
Washington County Service Co. Joe Povolish, Manager North Mill Street Nashville, Illinois 62263	Large - Multiple

MEAT PROCESSORS INTERVIEWED

AND PERSONS CONTACTED

Region I

Eagle Store — Secondary
Owen Kuhse - manager
Crestwood Shopping Center
Freeport, IL

Eickman Processing — Primary
Merlin Eickman - owner
Seward, IL

Highlander — Secondary
Doug Hershey- manager
3710 North Main
Rockford, IL

Kayser's Processing — Primary
Willie Kayser - owner
R.R.# 1 Box 1
Lena, IL 61048

Region II

Kroger — Secondary
Jim Macgrill
Sunnyland Shopping Plaza
Peoria, IL

Kroger — Secondary
John Hoag - supervisor
Brentwood Village
Decatur, IL

Rockes Meating Haus — Primary
Wes Lannert - manager
226 West Adams
Morton, IL 61550

West Meat Center — Secondary
Harold West - owner
Washington, IL

Region III

Country Fair Eisner Store — Secondary
John Steele
301 E. Wilbur Heights Road
Champaign, IL

Gifford Locker and Market — Primary
Bob Glazik - owner
P.O. 65
Gifford, IL

Hoopston Food Locker — Primary
Mrs. Mann - owner
210 East Penn Street
Hoopston, IL 60942

Richard's Food Store — Secondary
Geene Osterbur - manager
Market Street Mall
Champaign, IL

Region IV

Kents IGA — Secondary
Verlan Hibbs - manager
2305 West Monroe
Springfield, IL 62704

Kroger — Secondary
Herman Best - manager
Second and South Grand
Springfield, IL 62704

Oscar Mayer — Primary

Beardstown, IL

Y - T Packing — Primary
Joe Trasky - owner
R.R.# 5 Tainter Lane
Springfield , IL 62707

Region V

National Food Store — Secondary
Dave Pencak - manager
West Main Street
Carbondale, IL 62901

Pierson's Processing and Slaughtering — Primary
Randall Pierson - owner
Route 4
Murphysboro, IL 62966

Schuber's Butcher Shop Larry Schubert - owner Millstadt, IL	Primary
Shopland Joe Hoelscher - manager 1000 South Illinois St. Belleville, IL 62221	Secondary

 "END OF DOCUMENT"